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Staphylococcus Infections in Animals, with special reference to Toxoid in Preventive and Curative Treatment*

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During recent years there has been a great increase in our knowledge of the parasitic staphylococci. In 1928 there was an unfortunate incident at Bundaberg, Queensland, in which 12 out of 21 children died of staphylococcal septicaemia following the injection of a diphtheria toxin-antitoxin prophylactic mixture which was contaminated with staphylococci, and, largely in consequence of this, renewed attention has been given to these organisms. The outstanding feature of the work carried out since 1928 has been a realisation of the importance of a discovery made in fact many years previously, *viz.*, that many pathogenic staphylococci resemble diphtheria and tetanus bacteria in producing soluble toxins. This realisation may be said to have altered the whole outlook of preventive and curative treatment of staphylococcus disease, and in the field of human medicine, as will be shown below, much progress has already been made on these newer lines.

LESIONS PRODUCED BY STAPHYLOCOCCI IN ANIMALS

It will not be out of place to review and discuss briefly the extent to which staphylococci are known to be responsible, wholly or in part, for disease in animals. Infections can be conveniently classed as acute or chronic. *Acute* changes will include: (*a*) abscess formation in soft or hard tissue, the lesions being distributed in localised or generalised form; (*b*) suppurative inflammations of cavities or mucous membranes; (*c*) gangrene. Under the heading of *chronic* changes should be mentioned (*a*) lesions of the usual productive type, and (*b*) productive lesions in which the type of change is rather more specialised.

When the subject is considered in more detail, there come to mind the various suppurations of the integument, referred to as furunculosis (*e.g.*, of the skin of the udder in cows†) or as acne, while staphylococci have also been found associated with follicular mange and interdigital abscesses in dogs, and with such essentially necrotic inflammations as fistulous withers, poll-evil, and quittor in horses. Staphylococci can sometimes be isolated from cases of pyometra in bitches (private communication, Dr. R. Lovell), from the nasal discharges of dogs affected with (?) chronic sinusitis (personal experience in one case). In the latter the organisms were present in almost pure culture —an interesting finding, because in man there is good reason to believe that the nasal cavity sometimes acts as a reservoir for staphylococci (Dolman, 1935) and one would like to know how far this is true of animals also.

It is well established that staphylococci, pathogenic as well as non-pathogenic, are very common in the milk of cows, and that they may produce gangrenous changes in the udders of cows and also of ewes. It is not so widely realised that staphylococci are associated with a chronic or productive type of lesion in the cow's udder.‡ A chronic mastitis of a more special type, in which the lesions were "actinomycotic" in nature, was noted in a cow by Davies (1935). Finally, there is the condition known as "botriomycosis," seen in "scirrhous cord" and "shoulder tumour" in the horse. Here again, the lesion is of a more special type, but as it has been recognised for at least 20 years that "botriococci" are simply staphylococci, it would make for simplification if the term "botriomycosis" were abandoned.

It will be clear from this cursory and no doubt incomplete survey that staphylococci are

*Presented to the Central Veterinary Society at the Conway Hall, London, January 7th, 1937.

†An outbreak of this affection was recently brought to my notice by Mr. J. W. Hall Masheter, M.R.C.V.S., to whom I am indebted for material.

‡I am grateful to Mr. J. R. Rider, M.R.C.V.S., for assistance in an investigation now proceeding on chronic staphylococcus mastitis in cows.

responsible for much disease in animals and for quite a variety of pathological change.

Means by which Staphylococci Produce their Effects

Staphylococci are capable of forming a number of products of importance in disease. Many years ago it was shown that some of them can form "leucocidin," so named because it destroys leucocytes. More recently, it has been found that some strains form "enterotoxin," a substance responsible for some cases of "food-poisoning" in man, in which symptoms of acute gastro-intestinal disturbance are a pronounced feature. Most of the research of the last few years, however, has been concerned with the soluble toxin, a product which is different from both leucocidin and enterotoxin. As a rule, very little toxin is formed in ordinary aerobic broth cultures; to obtain good toxin production it is usual to grow the staphylococcus on thin layers of soft agar in an atmosphere containing 20 to 30 per cent. CO_2. The presence of toxin in filtrates can be shown by a strong haemolytic effect on red blood corpuscles, by the fact that the filtrate causes necrosis of the skin on intradermal inoculation of such animals as guinea-pigs or rabbits, or by its killing power for animals when given intravenously. Until 1935 it was generally believed that staphylococci formed only one kind of toxin, but this is now known to be incorrect. In 1935 Glenny and Stevens, at the Wellcome Physiological Research Laboratories, proved that some staphylococci can form two kinds of toxins, which they designated α and β, and for each of which specific antitoxins can be prepared. They found, however, that most staphylococci from human disease form the α toxin only. Unfortunately, there is reason to believe that the matter is still more complex, and it is now suggested that the α toxin may contain two separate toxic components. In 1936 I was able to show that β toxin production is characteristic of most strains of parasitic staphylococci from animals, and that some produce very small or undetectable amounts of the α toxin. There was also some evidence from my work that staphylococci from dogs produce a toxin which is different from either α or β.*

Immunity Against Staphylococci

Experimental investigation is now making it more and more clear that staphylococcus immunity is antitoxic rather than antibacterial in nature. Thus, the injection of antitoxin into experimental animals such as rabbits gives them great resistance against the effects of living staphylococci. Similarly, in endeavouring to protect rabbits against an intravenous injection of a lethal quantity of staphylococcus culture it is of little value to treat them beforehand with dead organisms. If instead they are given toxoid or altered toxin before the test dose of culture is injected, survival is greatly prolonged or the animals may remain alive (Parish, O'Meara and Clark, 1934).

[The day after this meeting of the Central Veterinary Society, A. W. Downie, of the London Hospital, described before the Pathological Society some striking results of immunisation experiments in rabbits. Rabbits repeatedly injected with a heat-killed suspension of staphylococcus, from which all toxin had been washed, were no more resistant than untreated controls to intradermal injections of living staphylococci or staphylococcus toxin. On the other hand, rabbits injected, on the same days as the washed suspension was used, with toxoid prepared from the same strain, were highly resistant to similar test doses of the living culture or toxin. Antitoxin was present in the blood of the toxoid rabbits but not in those injected with the heat-killed culture. I have to thank Dr. Downie for permitting me to mention his findings here.]

Again, the blood of many "normal" adult animals and people contains appreciable quantities of staphylococcus antitoxin. This is, of course, not surprising in view of the ubiquity of parasitic staphylococci and the frequent recurrence of superficial infections. When, however, there are deep-seated infections of bone or muscle, the amount of blood antitoxin is in general higher than in superficial infections, and it has been claimed that a high antitoxin titre is sometimes of diagnostic importance.

Preventive and Curative Treatment

Treatment of staphylococcus infections can now be carried out on more rational lines than heretofore and there are already in the medical literature a number of reports testifying to the value of staphylococcus toxoid and a few which show the value of antitoxin. I propose in the first place to deal briefly with the way these products are prepared and the principles underlying their use in man, and then to allude to some of the results obtained.

Staphylococcus antitoxin, like many other sera intended for therapeutic use, is produced in horses, the animals being injected repeatedly with toxin or toxoid in a form and at intervals which experience has shown to be most suitable. The strength of such sera is expressed as units of antitoxin per c.c., the unit being defined in terms of an agreed international standard. As with tetanus and diphtheria antitoxin, it is now possible, therefore, to treat the patient with so many units of staphylococcus antitoxin; in other words, to regulate the dosage as the circumstances appear to require. As with other

*My colleagues, Professor Wright and Mr. J. W. Holmes, kindly supplied the material from which the dog strains were isolated.

antitoxins, too, it is now possible to separate from the serum that fraction which contains the antitoxins, so that both purified and highly potent products are available. Treatment with specific antitoxin is recommended for such severe and acute infections as osteomyelitis, septicaemia, or any toxaemic conditions caused by staphylococci. In such cases, of course, it may be necessary to act promptly, the antitoxin being given intramuscularly (Panton, Valentine and Dix, 1931). If the acute stage is passed, it is advantageous after a time to continue with a course of toxoid.

Staphylococcus toxoid is used for subacute and chronic infections and these are, of course, far more common than the acute case. The preparation of toxoid is quite simple in theory. It is merely necessary to add formalin in low concentration, say, 0·3 to 0·5 per cent., to the toxic filtrate, and to leave the mixture at 37° C. until it is completely "inactivated," *i.e.*, until it no longer haemolyses red cells, and fails to cause necrosis on intradermal injection in guinea-pigs. When this point is reached, the mixture will be found to be no longer either lethal or dermonecrotic. In practice, the preparation of toxoid requires skill and experience. It must be prepared from strong toxins and for use in man must pass certain tests which are laid down in a Schedule (issued in 1935) to the Therapeutic Substances Act of 1925. In short, all possible precautions have to be taken that the toxoid is "potent"; that is to say, that it can be depended upon to stimulate a good antitoxic response in the average subject.

In man it is usually recommended that in the first place a course of six or eight intramuscular injections should be given at intervals of five to seven days, with perhaps an interval of 14 days between the last two injections. Quite small increasing amounts of toxoid are used, such as: 0·05, 0·1, 0·2, 0·4, 0·5 and 0·6 c.c. A blood sample is taken before treatment and about ten days after the last dose, as it is important that antitoxin response of the individual should be determined. In this respect patients vary considerably, the response depending to some extent upon the titre before treatment, but the aim should be to raise the antitoxin titre by not less than ten-fold. It may be valueless or even harmful to continue the injections beyond six or eight, and in many cases it will be thought unnecessary to do so owing to the clinical improvement which has become apparent. Except in comparatively slight infections, however, it is recommended that after a rest of a few weeks a second course of injections should be given, and in order to avoid excessive reactions it is important that a beginning should be made with quite small doses.

One great advantage of using toxoid is that the progress of treatment can be controlled by measuring periodically the level of antitoxin in the blood. As Whitby (1934) has pointed out, no simple test of this sort is available with vaccines, where the only control is clinical, by noting whether there is cure or relapse. The aim, then, should be to keep the patient's response at its maximum long enough to enable the tissues to deal with the staphylococci. The time required for this varies greatly from case to case. Clinical relapse is associated with a significant fall in the amount of circulating antitoxin, so that by following the blood titre the practitioner may be forewarned and given a chance to stave off a relapse. Where cases have tended to be intractable—and this is not uncommonly a feature of staphylococcus infections—it is advised that an occasional small dose of toxoid should be given at long intervals and for some months after apparent clinical cure.

Those interested in the results of clinical trials of toxoid in man should consult papers by Connor and McKie (1934), Whitby (1934, 1936), Murray (1935), and Dolman (1933, 1935), who have, in the aggregate, treated at least 700 cases. For those who have difficulty in consulting the original papers, it will be useful to quote a few passages.

Whitby (1934), working at the Middlesex Hospital, states that in his experience "toxoid has given more consistent results in a series of over 100 localised staphylococcal infections than any other antigen I have previously used. No case has failed to show a rise in anti-haemolytic titre of the blood, relatively few have failed to respond to treatment, and anything more serious than a slight local reaction has been extremely rare. The treatment has usually occupied about four weeks, whilst the number of injections and the volume injected are both small. The response to treatment, as measured by anti-haemolytic titre, is variable from subject to subject. Some have a high titre at the outset, and this is especially so with deep-seated lesions. Some respond to small doses, others require continuous treatment. I have found that the best rule is to aim at raising the titre to at least ten times its original level rather than to name a fixed level above which any given patient may be said to be immunised. I am quite sure that staphylococcal toxoid, after proper trial, will find a prominent place in the future treatment of localised staphylococcal infections."

In 1936 Whitby reported favourably on a further series of 200 cases.

Murray (1935) treated 116 cases at the Royal Hospital, Richmond, including patients with acne, blepharitis, furunculosis, or carbuncles. "All these patients had had various other treatments without continuous or striking benefit. Local applications, colloidal preparations of manganese or tin, vitamin concentrates, and, in

a few cases, vaccines, had been tried in turn." Of these 116 cases, 51 recovered (absence of fresh lesions for six to eight months), 56 improved, and nine showed slight or no benefit. In writing of the "improved" cases, he states that some of them "have been very bad and very chronic cases, and that the degree of improvement has been quite remarkable." He states, further, that "the number of really severe local reactions has been remarkably small. I have given over 1,000 injections and had notes of only 17 causing what the patient considered a really painful arm." One point to which special attention is called is that patients feel very much better in their general health after a course of toxoid, even in cases where the local lesions still look very unhealthy or have not completely healed. Dolman (1935), of the Connaught Laboratories, Toronto, reported on 306 cases, the clinical manifestations of which were quite varied, and which included 81 cases of recurrent furunculosis, 59 cases of chronic or subacute osteomyelitis, and 42 cases of acne. "Many of the patients had already failed to benefit from a wide variety of treatments, such as stannoxyl, yeast, ultra-violet irradiation, restricted diets, autogenous and stock vaccines, and an assortment of home remedies." In most cases, however, the results of toxoid treatment were favourable, and in some clinical conditions the results were described as excellent. Writing of the cases of subacute or chronic osteomyelitis, he states that "the first two or three doses of toxoid were usually followed by an increased discharge of pus from the osteomyelitic focus, but the discharge later tended to diminish. In a few children with several years' history of chronic osteomyelitis, one or more discharging sinuses healed over for the first time during or soon after administration of a course of eight injections, and there have since been no recurrences. . . . In three instances (in adults) it became possible to retain a limb which had been threatened with amputation. About 10,000 patients are estimated to have received a total of nearly 100,000 injections of staphylococcus toxoid prepared in the Connaught Laboratories." The age limits of Dolman's patients were two months and 89 years and there were no alarming reactions. He goes on to state that, "The undetermined amounts of dissolved bacterial substances present in staphylococcus toxoids seem unlikely to contribute to any significant degree to the therapeutic efficacy of these products. On the other hand, the good results sometimes obtained with staphylococcus vaccines are probably due chiefly to the toxin or toxoid present in the particular vaccine used. The average staphylococcus vaccine, stock or autogenous, is greatly inferior to a potent toxoid as an immunising agent, and hence presumably lacks the essential antigens. I have frequently noted that patients with a long series of multiple and recurrent boils, treated without benefit with staphylococcus vaccine, have shown a titre of circulating antitoxin which was little, if at all, above the average. But a few injections of toxoid in such patients brought about apparent clinical immunity and a definitely increased antitoxin titre."

Perusal of the papers from which passages have been quoted leaves the strong impression that, when potent toxoid is used in the proper way, the results are more favourable than are likely to follow any other known form of treatment. Very few unfavourable reports have appeared, and one of these has been criticised by Dolman (1934) on the grounds that the toxoid was prepared from a single strain of staphylococcus and was not tested for its potency, and that many of the cases (acne) were not well adapted for treatment. Naturally, there will be some disappointments, even when good toxoid is used: poor results may be due to one of a number of causes, such as the presence of mixed infections, *e.g.*, in acne; repeated reinoculation, *e.g.*, of the skin of the face from the nasal cavity; the presence of much necrotic tissue and particularly of necrotic bone. In such cases as these no one would wish to suggest that toxoid should be used exclusively. Surgical measures would be carried out when common sense indicates that they are necessary; in mixed infections the use of an appropriate autogenous vaccine, as well as staphylococcus toxoid, might give more happy results; the use of an autogenous staphylococcus vaccine reinforced with toxoid might prove better than toxoid alone in very intractable cases or in deep-seated infections where there is much invasion of tissue. In this connection it should be noted that staphylococci isolated from such infections usually produce abundant leucocidin, while they may produce little or only average amounts of toxin (Valentine, 1936). Finally, it is no doubt important that patients under treatment should be rested, or at least that undue fatigue should be avoided.

So much for the results obtained in man. In conclusion, I would ask you to consider what can be done for animals. It would seem to me likely that at least some of the conditions mentioned earlier in this paper would respond to toxoid, while in others antitoxin would be indicated at the beginning. What would appear to be required now is a thorough clinical trial of staphylococcus toxoid in veterinary practice. Such a trial in human practice was organised by the Medical Research Council's Therapeutic Trials Committee. There seems no reason why a similar trial should not be made with animals, but, if the results are to be reliable, it would have to be carefully organised and carried out on sound lines by clinicians and pathologists working in close co-operation.

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Discussion

Major T. Dalling opened the discussion in the following terms: I am sure you will agree with me that Dr. Minett should be very heartily congratulated on his lecture. He has put the subject before us in such a way that even though we may not be well acquainted with the various aspects of staphylococcus infections we now realise the importance they may play in animal disease. Dr. Minett has broken new ground to-night and has impressed on us once more that the result of research work has often a practical bearing for the veterinary practitioner.

I am sure that many of us never realised till to-night the significance of a staphylococcic infection. Until it was shown only a few years ago that staphylococci could produce potent toxins, many of us were apt to regard these organisms as a bit of a nuisance, for they kept cropping up in some of the cultures, etc., which we made in the course of our investigations and we regarded them mostly as contaminations often picked up accidentally. Even when the examinations showed that staphylococci were present in pure culture, I am afraid that we regarded their presence as of little or no significance. Well do I remember many years ago examining material from mastitis in ewes and finding nothing but staphylococci. We know now, of course, that in all probability the infecting organism in such cases is the staphylococcus. I heard only the other day from a veterinary surgeon that in some cases of metritis in ewes following dystocia the only organism isolated was the staphylococcus. I do feel that we must regard this organism in the future with much more respect than we have done in the past.

I am not sure why Dr. Minett asked me to open the discussion on his paper unless it is for the reason that I have had some experience in the preparation and use of toxoids in the prevention of disease. Dr. Minett has explained what a toxoid is. My experience with toxoids relates to anaerobes mostly and is concerned chiefly with the prevention of anaerobic infections in sheep. We have found that the toxins produced by the various anaerobes infecting sheep can, when treated with formalin, under certain conditions be rendered harmless for the sheep when injected, but they retain a high antigenic value and produce a high degree of immunity. In connection with such toxoids there are several points that must be carefully attended to and Dr. Minett referred to most of them in his address. It is necessary to select certain strains of the organism to be used in the preparation of the toxoid. Some strains seem to have much better qualities from an antigenic point of view than others and usually such strains are capable of producing toxin of high potency. The method of toxoiding, though appearing to be simple, varies in the case of different organisms and it is only by experience that the best method can be devised. Toxoids must be proved to be innocuous and yet highly antigenic. To establish these points elaborate testing in the laboratory must be carried out. Some organisms produce more than one toxin.

Dr. Minett has referred to two types produced by staphylococci. In the *B. welchii* group of anaerobes there are at least five recognised to-day. In the preparation of a toxoid it is necessary to ensure that all the toxins connected with the organism are present in the material to be toxoided. It is only by so doing that one can be reasonably certain that the toxoid will have beneficial effects when injected for a specific condition.

The use of toxoid has largely replaced the use of vaccines made by culturing and heating the organisms. For many years vaccines have been used in the treatment of conditions in animals caused by staphylococci and other organisms and in some cases at least reports of good results have been obtained. One wonders very much if there was any true value in the older type of vaccine. I do think that in some cases these vaccines were beneficial. In the light of recent researches in which it has been shown that toxins are the essential products of the organism concerned in the production of disease and that immunity is derived mostly by the production of antitoxin, one wonders what effect the use of the older type of vaccine could have had. It seems possible that in their preparation some toxin was produced and became toxoided in the process of making the vaccine and that in those cases which responded to the injection of vaccine there was present sufficient toxoid to be effective. During the Great War we practised vaccine therapy in the treatment of many war and operation wounds in horses. Staphylococci were often present. One wonders now whether the old type of vaccine would have given place to toxoid had we been in possession of the present-day knowledge of the subject.

Dr. Minett referred to the course of injections in connection with staphylococcus toxoid. I think that a short course of small doses should be given and if the condition has not cleared up an interval of several weeks should be left and a further course given. We find in some of our sheep work that the injection of two doses of a toxoid at an interval of several weeks is followed by a higher degree of immunity than when the interval is shorter. Perhaps the outstanding example of the use of a toxoid in the prevention of a disease is in connection with tetanus. It is found that one injection of tetanus toxoid gives rise to a fairly high degree of immunity in horses. If a second injection is given a month after the first the degree of immunity is materially increased. This method of protection against tetanus is now being practised in some districts in which cases of the disease are of common occurrence.

I do think that the use of staphylococcus toxoid in the treatment of suitable cases should be tried clinically. I have no doubt that Dr. Minett will be willing to advise veterinary surgeons on the matter.

There are three points I should like to raise before finishing. What does Dr. Minett think of the use of staphylococcus toxoid in treating interdigital abscesses in dogs? We know, of course, that the initial cysts are usually sterile, but it seems to me that in recurring cases which often yield staphylococci in culture, this method of treatment might be of value. Has Dr. Minett any experience of staphylococcic infections in poultry? From time to time poultry are found in which a staphylococcic septicaemia occurs and others in which there is staphylococcic arthritis. In young birds epidemics of these infections may occur. Would Dr. Minett tell us very briefly how he tests for the presence of staphylococcus antitoxin in the blood of animals?

Captain W. J. Leyshon said that he was one of those people who rarely got on his feet at such meetings, but he felt forced to do so that evening, to voice his appreciation of the very valuable contribution they had received from Dr. Minett as well as of Major Dalling's opening.

As he saw it, Dr. Minett's paper might be described as a revolution in the treatment of staphylococcus infections and some of the remarks he would like to offer would really be but a reiteration of what had been said already by Major Dalling.

Referring, however, to ovine mastitis, he did not find it easy at first to reconcile the facts that the presence of staphylococci was capable of causing such devastation of tissue. But his opinion had changed when, after collecting for some four consecutive seasons as many cases as he could find, sowing out from the udders within a few hours of death and also from ewes slaughtered in the later stages of the disease, the organism which appeared persistently and purely in culture, was a staphylococcus. In the Eastern Counties his experience of "black garget" was that although the incidence was not considerable, the mortality rate was high. Death usually supervened after an illness of only a few hours' duration, whilst recovery might be expected if the ewe survived some four to five days.

Dr. Minett had shown them that since that time (ending 1928), by the use of specially prepared culture media, a very potent exotoxin could be obtained from parasitic staphylococci. He (Captain Leyshon) realised now that if, at that time, toxin had been isolated, antitoxin prepared and administered, a goodly number of such cases might have been saved. To practitioners meeting with cases of this type of mastitis, he would suggest this line of therapy as worthy of trial.

He would like to ask Dr. Minett whether he had experience of the use of toxin in the treatment of the furunculosis of the cow's udder commonly referred to as "boils," and if so whether the use of such an antigen had cleared up the condition more quickly than might be expected in the ordinary course of events.

Captain L. S. Balls stated that he would like to learn more about those boils of the cow's udder. How was the infection carried—was it by the milk?

Professor G. H. Wooldridge (Vice-Principal of the Royal Veterinary College) observed that, unfortunately, he was detained and arrived at the meeting rather late; consequently he had heard only a part of Dr. Minett's address and so was not in a position to discuss the subject at all in detail. Since he had been there, however, he had been very interested indeed to realise the emphasis that had been laid on the increasing accession of knowledge in connection with staphylococci and the damage they produced.

They were taught in the early days that staphylococci were in most cases very little more than simple passengers and it was interesting to one brought up in that tradition to find that these organisms had been shown to be so much more important. They were told that no immunity occurred after repeated attacks, because they did not produce potent toxins. He could foresee a series of good results likely to be obtained in staphylococcal injection treatment by toxoids in the future and he should certainly do his best to collaborate with Dr. Minett in the use of that toxoid.

One of the few things in which staphylococcic vaccines had been of use had been in some of those follicular mange cases of the pustular type: they had cleared up the pustules although they had not destroyed the skin lesion. In the pustular type of follicular mange, one might be able to get considerable help from the use of the toxoid. The same applied, as Major Dalling had pointed out, to interdigital abscesses of the dog's foot. He was pleased to hear Major Dalling say that these were sterile at the outset, because that was his own view, and that the staphylococcic infection was a subsequent one. Vaccines, in many cases of that sort, had been valueless, in his experience and, he thought, in that of many others. Toxoid might prove very useful in that secondary condition. It might also prove to be of some value in the botriomycotic type of lesion in horses, especially in those cases which, owing to their diffuse character or from their size or situation, had come to be regarded as being inoperable. Toxoid treatment might reduce such lesions to operable dimensions.

He should look forward to reading in detail the full paper that Dr. Minett had produced.

Mr. G. W. Searles said that he met with a great number of cases of bovine mastitis and had used quite a lot of staphylococcic vaccine:

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he frequently had thought that such a vaccine did assist in these cases. Would Dr. Minett give his views as to whether the vaccine used in conjunction with the toxoid might be useful or whether they would aggravate one another?

Mr. N. J. Scorgie observed, with regard to the question of gangrenous mastitis in cattle, that he thought there had been one or two reports in recent literature that, in addition to staphylococci being isolated from the secretion, there had also been isolated an anaerobe. He would like Dr. Minett to tell them the significance of that anaerobe; whether it was more pathogenic than the staphylococcus.

Lieut.-Colonel H. Greenfield, having expressed his appreciation of the address, stated that during the course of practice he used normal saline injections very freely for anything in the nature of a toxaemia, and he found that (using a rather large needle for the purpose of giving big doses) if he met with symptoms of the haemolytic type and a blood-tinged serum exuded through the needle the case was not likely to recover. Of course there were many other haemolytic agents than the staphylococcus, but he would like to ask Dr. Minett whether he thought that this might indicate that the patient's resistance had deteriorated and that there was staphylococcal invasion and whether he was of opinion that that toxoid might be of value in such cases, which he (Colonel Greenfield) found so frequently fatal. He administered the normal saline subcutaneously.

Major A. A. Pryer commented that Dr. Minett's address had been a most interesting one, and whilst he thought that Dr. Minett had given them very good grounds for forsaking treatment by vaccine, he felt that the results obtained by some of them in the past indicated that perhaps a little more of the toxoid adhered to the vaccine than they anticipated.

He desired to quote an instance indicative of the antigenetic value of certain vaccines. Fifty horses came to his notice which were suffering from nasal catarrh. They had been under treatment for an average of 55 days without any retrogression of the symptoms, but with a staphylococcic vaccine which was administered in four doses, with a four-day interval between doses, they recovered in an average of 20 days after receiving the first dose.

Could Dr. Minett tell them anything about the effects of heat and other chemical agents upon the staphylococcic toxins and to what extent they were capable of resisting these agents?

The President (Professor J. G. Wright), said that before calling upon Dr. Minett to reply, he wished to thank him personally for the excellent paper he had given them, for it was essentially a practical one. He congratulated him upon making the subject of therapeutics the main theme of his remarks, for these chronic suppurative conditions about the skin in animals were often most difficult to treat; at the same time he would thank him for not submerging them in a sea of science. (Laughter.) He (Professor Wright) would stress that they must impress upon themselves the absolute necessity for establishing, before employing toxoid, that they were dealing with a staphylococcal infection, for he feared that there might be a tendency to use the treatment indiscriminately in all forms of chronic suppuration, and this, of course, would only bring the method into disrepute. In this connection he thought that Dr. Minett was drawing a lot of work upon himself, for he visualised that in the future he would be called upon to make a large number of cultures.

His second point was that, as he understood it, toxoid immunity would be of greater value as a prophylactic in animals susceptible to staphylococcal infections, than as a curative measure. Their chief surgical difficulty was that the site of many of these chronic infections was such that consequent upon pus burrowing down intermuscular septa effective drainage was difficult or even impossible to attain. He appreciated that in such cases the production of a cellular immunity against the destructive action of staphylococcal exotoxin might prove a valuable adjunct to surgical treatment.

He would again thank Dr. Minett and Mr. Dalling for the help they had given them that evening. (Applause.)

The Reply

Dr. Minett said they were very fortunate that the discussion had been opened by Major Dalling, who had had so much experience of toxins and toxoids in other affections.

The President had made a point which deserved to be stressed, *viz.*, the importance of diagnosis. The action of staphylococcus toxoid was before all things specific, so that, unless proper care was taken to establish the diagnosis, *i.e.*, unless toxoid was used solely for conditions known to be due to toxigenic staphylococci, the reagent might easily fall into disrepute. The same was, of course, true of other specific products and as an example "entozon" might be mentioned; this was certainly active in streptococcus infections, but he had yet to learn that it was endowed with special activity against other bacteria. In regard to the points brought up by Colonel Greenfield and Mr. Searles, he would say, therefore, that it was largely a matter of being sure about the diagnosis.

As he had said before, a clinical trial, if it were to be of real use, would have to be carefully organised,* and the procedure would be briefly as follows. A swab would be taken from the lesion, with proper precautions against external contamination, and sent to the laboratory. If the diagnosis was positive and the case was considered suitable for toxoid treatment, a sample of blood should be drawn before starting the course of injections—and these, as Mr. Dalling had reminded them, must be properly spaced—after which a second blood sample would be taken and a report made on the clinical condition. Subsequent treatment, where necessary, would follow the lines indicated in the paper, and one would be guided in this by the degree of antitoxin response and the clinical condition. The speaker judged that it would be very important not to neglect any surgical measures that might be necessary, simply because toxoid was being used. Such measures, especially the provision of good drainage, would be necessary, he believed, in the instance mentioned by the President, *viz.*, fistulous withers.

He did not desire at that meeting to enter into laboratory details. Hence, in estimating the amount of antitoxin in a sample of serum, he would merely say that it was a question of finding how much toxin that serum would neutralise by comparison with a standard serum of which the unitage was known.

With regard to vaccines, the speaker agreed with Mr. Dalling that results collected over many years could not be ignored and there seemed

*It is hoped that a trial of toxoid may be possible in the near future. Until arrangements for this are completed, Dr. Minett requests any practitioners who are interested, not to forward material from cases.

no doubt that autogenous vaccines were beneficial at times. It had been suggested that this was due to the vaccines containing traces of toxoid, but he was not prepared to believe this was always so. If the vaccine was made by heating the bacterial suspension for, say, 30 minutes at 60° C., the toxin would be destroyed—and Major Pryer stated that he had found vaccines of benefit in nasal catarrh in horses. After all, some staphylococci produced a lot of leucocidin and little exotoxin, and leucocidin itself was antigenic. Nevertheless, evidence from the medical side clearly showed that toxoid, prepared from highly active exotoxins, was often superior to the dead organism as an immunising agent. As to the conditions in animals in which toxoid might be used, he quite agreed with Professor Wooldridge that it would be well worth a trial in interdigital abscesses in dogs and in the suppurative skin conditions associated with follicular mange. In "botriomycosis," on the other hand, there was so much new tissue production that surgical treatment would no doubt be necessary.

In reply to Mr. Dalling, he had had no opportunity of studying staphylococcus infections in poultry or metritis in ewes. As to mastitis in sheep, Mr. Leyshon seemed to be about the only one in this country who had seriously investigated the disease, and he had shown the importance of staphylococci. He (Dr. Minett) was on the point of investigating the use of toxoid in the prevention of ovine mastitis, in collaboration with Mr. C. V. Watkins, M.R.C.V.S., of Seale-Hayne College. It was proposed to try on 50 ewes the effect of two subcutaneous injections of diluted toxoid at three to four weeks' interval during pregnancy, with perhaps a third dose during lactation. A similar number of untreated ewes would be observed. Ovine mastitis was sometimes quite a serious scourge, and for acute cases no doubt it would be correct to inject antitoxin. He believed also that staphylococcus antitoxin should be tried in the less common gangrenous mastitis in the cow, though, as Mr. Scorgie had said, there was suggestive evidence that anaerobic bacilli might sometimes be responsible.

One or two speakers had enquired about inflammation of the skin of the udder in cows. The origin of this was probably to be explained by infection being favoured by clipping of the hairs, washing the skin, and contamination of the cloths used for drying. He had had no opportunity of seeing cases but, according to Mr. Hall Masheter, the disease tended to retrogress spontaneously.

The speaker concluded by thanking all those present for their kind attention.

SILVER NITRATE OINTMENT FOR BURNS

An ointment of silver nitrate has been used successfully for about 25 years for the treatment of less severe burns and scalds in the skin department of the Kommune Hospital, Copenhagen. The ointment's composition is as follows: Silver nitrate 0·25 gm., distilled water 20·0 gm., olive oil 25·0 gm., wool fat 50·0 gm. The burn is cleansed with sterile normal saline and the vesicles are removed; a thick layer of the ointment is applied on a piece of old soft linen, which is then covered with an imperishable material like oil-silk, and held in place by a gauze bandage. The ointment is renewed once a day, the burn each time being cleansed with normal saline.—A. Kissmeyer (*Lancet*, 1936, 231, 985).

The Veterinary Record

February 13th, 1937.

Staphylococcus Infections

A SIGNIFICANT change in our outlook, both in pure and applied bacteriology, has lately become apparent. Whereas at one time we were content to say that a disease process was caused by a species of bacterium, we now seek to discover exactly how pathogenic bacteria produce their ill-effects, and how to separate, where possible, the toxic from the non-toxic parts. When the method of attack is understood, it becomes possible to protect animal hosts much more effectively against pathogenic bacteria.

For many years it has been known that certain bacteria, such as the tetanus and the diphtheria bacillus, are pathogenic because they form a filterable toxin; now Dr. Minett emphasises afresh, in his article on other pages of this issue, that certain staphylococci also produce a toxin, and that staphylococcal immunity, too, is mainly anti-toxic and not anti-bacterial. Here we have yet another example of the value of academic research, and the review of the work on staphylococci given in Dr. Minett's article enables us to appreciate the vast amount of preliminary labour necessary before any practical results can be achieved. The bare statement of fact is of greater importance than is at first realised, and it is now possible to assess the work which has been done on the haemolytic properties and other cultural characteristics of staphylococci. This is shown to be of practical value because it is now known that staphylococcal toxins also act as haemolysins. The test for haemolysis, therefore, can be put to practical use in determining whether staphylococci produce toxins and, if so, in estimating their strength and that of the corresponding antitoxins. There has now been placed in our hands a more rational method of treating staphylococcal infections.

Dr. Minett has rendered our profession a service in focusing attention upon the value in certain human conditions of staphylococcal antitoxin and, more particularly, of staphylococcal toxoid, and we welcome his suggestion that a clinical trial should be carried out among animals. As he points out, if this trial is to be effective it must be carefully organised, and there must be free co-operation between

the clinician and the laboratory worker, since it is essential that only cases caused by toxigenic staphylococci should be treated, that the antitoxin content of the patient's blood should be determined periodically, and that the experiment should include an adequate number of animals both as patients and controls. Such an investigation, involving, of necessity, bacteriological diagnosis, would not only confirm our knowledge of the many conditions already known to be due to staphylococci, but would have the additional advantage of throwing light on a number of other conditions whose aetiology is still obscure or uncertain.

CLINICAL COMMUNICATION

Insulin in the Treatment of Equine Myoglobinuria*

J. G. Wright, F.R.C.V.S.,
Royal Veterinary College

The reference of Mr. L. S. Balls to so-called "azoturia" (equine myoglobinuria) in the horse, and Dr. Minett's significant question as to whether the animal had received a diet rich in sugar during its period of rest, prompted the President (Professor J. G. Wright) to recount two cases in which insulin had been used in the treatment of this disease.

In the *Veterinary Record* towards the end of 1935 (1935, No. 45, Vol. xv, p. 1346) appeared an abstract of an article from German literature recording the successful use of insulin in the treatment of equine myoglobinuria. The treatment was based on the biochemical findings that there is marked hyperglycaemia, together with an increase in the phosphate and creatinin, and only a very slight increase in the lactic acid of the blood. A few weeks later W. A. Campbell (*Veterinary Record*, 1935, No. 51, Vol. xv, p. 1547) recorded his experience of the use of the drug in a very severe case. Whilst he was not successful in saving the animal, he expresses the opinion that the agent definitely had a palliative action, and his intention to employ it again.

. . . . . .

Case No. 1

Subject.—Black pony mare. Approximate age, 15 years; approximate weight, 650 pounds. Condition good.

History. *Wednesday, June 3rd*, 1936, 11 a.m. Animal had been rested over Whitsun holiday, from Saturday mid-day until Wednesday morning. It had been kept on its full working diet of a mixture of oats and chaff. During the morning it had drawn a light load a distance of five to six miles. Whilst unloading it was noticed to be staggering on its hind limbs, and this was soon followed by its going down. It arrived at the College down in the ambulance.

Examination.—Temperature 100·1° F. Pulse 58. Sweating of the quarters and flanks. Frequent and vigorous, yet unsuccessful, attempts to rise. The quadriceps and gluteal muscles of both hind legs were tense and hard. Urine—(obtained by catheterisation)—coffee coloured, alkaline in reaction. Spectroscopic examination (Mr. E. G. White) positive for myoglobin.

The animal was comfortably bedded down on the ride. At 5 p.m. (seven hours after the onset of symptoms) 100 units of insulin administered by intramuscular injection behind the shoulder.

Second day.—No change. Vigorous attempts to rise. Two bran mashes offered and taken readily. Drinking a little. Temperature 100°; pulse 52. Defaecating normally. No urine passed during day.

One hundred units insulin given.

Third day.—No appreciable change, lying quieter and not often attempting to rise. Appetite fair, defaecating. Urine withdrawn by catheter—still very dark in colour.

One hundred units insulin given.

Fourth day.—Still down; seems weaker; palpation of the affected muscles causes pain. Temperature 100·6°; pulse 48. Taking mashes, defaecating.

One hundred units insulin given.

Fifth day.—No change; has urinated during night in straw; eating and drinking. Temperature 101°.

One hundred units insulin given.

Sixth day.—9 a.m. Temperature 103·2°. Has developed a severe bed-sore on left haunch. Again making vigorous attempts to rise and with assistance is just able to do so.

One hundred units insulin given.

At 10 a.m. mare rose unaided, and with assistance was able to walk to a box where she was placed in slings.

At 5 p.m. the slings were removed and animal was allowed to lie down. During the evening she got up and down several times.

Seventh day.—Great improvement; mare rises without much difficulty, and is able to stagger around box. Temperature 101°. Pain on palpation of affected muscles severe. Appetite good. Mare seen to urinate by attendant who describes urine as being milky white in colour.

One hundred units insulin given.

*An extract from a discussion on interesting case reports held at a meeting of the Central Veterinary Society, on January 7th, 1937.

Eighth day.—Bed-sore commencing to slough, causing considerable pain and stiffness in near hind. Lying down more but quite able to rise. Has not defaecated for 24 hours. Magnesium sulphate half-a-pound with sodium bicarbonate two ounces, dissolved in drinking water. Mare drank a little only, but during day defaecation occurred.

One hundred units insulin given.

Ninth day.—Much improved. On feet the whole of the day, moving quite freely. Eating, drinking and defaecating normally.

One hundred units insulin given.

Tenth day.—Improvement maintained. Animal walks freely but for slight lameness in near hind leg, attributable to bed-sore. No pain on palpation of muscles but atrophy marked.

One hundred units insulin given—last dose.

The mare was kept in hospital for a further five days, during which time progressively increasing exercise was given. By the fifteenth day the mare trotted vigorously without lameness, and the effort caused her no discomfort. The bed-sore was rapidly healing by granulation. The mare was walked home to Walworth.

In the speaker's view this could be fairly described as a severe case.

Case No. 2

Subject.—Black vanner gelding. Approximate age, 12 years; approximate weight, 1,350 pounds. Condition, good.

History. *Monday, December 28th*, 1936. 1.30 p.m. The animal had been rested over the Christmas holiday, from Thursday evening to Monday morning. It had been given its normal working diet of a mixture of oats and chaff. Recommenced work at 7 a.m. to-day and symptoms were first noticed at 9 a.m. when the animal was standing. It was observed to be crouching on hind limbs, and soon went down. The animal was down in the ambulance on arrival. It had been observed to void dark-coloured urine on two occasions.

Examination.—Animal making vigorous, but unsuccessful attempts to rise. Profuse sweating. Quadriceps muscles of both hind limbs tense and boarded. Temperature 100·2°; pulse 68.

One hundred and fifty units of insulin administered intramuscularly into neck at 2 p.m. (five hours after the onset of symptoms).

Second day.—Temperature 100·8°; pulse 54. Still making vigorous attempts to rise. On one occasion it was able to rise on its hind limbs with the joints partially flexed and the muscles quivering for a few minutes, after which it went down again. Taking bran mashes and picking long hay. Defaecating. Urination not observed.

One hundred and fifty units insulin given at 9 a.m.

Third day.—Nine a.m. Animal standing. It remained on its feet for five hours during day. Crouches and staggers when moved. Eating and defaecating. Urination not observed. Rectal examination reveals bladder empty. Quadriceps muscles, especially the left, boarded. Pain on pressure.

One hundred and fifty units insulin intramuscularly.

Fourth day.—Standing the greater part of the day. Hind limb action greatly improved.

One hundred and fifty units given at noon.

Fifth day.—Moves quite freely, hind limb action almost normal, but inclined to drag the off hind toe. Otherwise normal. Quadriceps soft and relaxed, not painful.

One hundred and fifty units insulin given.

Sixth day.—Action at the walk normal, at the trot slight inco-ordination.

One hundred and fifty units insulin given—last dose.

Seventh day.—Animal able to trot normally. No atrophy of the affected muscles has occurred. This animal was kept in hospital for a further five days, at the end of which time it was considered fit for work.

This case is deemed to be one of medium severity. It is considered remarkable that the animal was normal again in seven days.

. . . . .

Professor Wright continued: Not having had much experience of this disease, and being a little uncertain as to the results that might reasonably have been expected in these two cases had the usual forms of medicinal treatment been adopted, I have enquired from four experienced London practitioners what is the prognosis in those cases in which the animal goes down. Three gave the reply that 90 per cent. proved fatal or were destroyed, and the fourth that 75 per cent. were hopeless.

. . . . .

Discussion

Mr. H. D. Jones said that he was particularly grateful to the President for his contribution, because he had always felt that the recovery of an animal from an attack of "azoturia" was more the result of good fortune than of any treatment they might have adopted. He, for one, would be only too glad to employ the line of treatment of this intractable disorder put forward by Professor Wright.

The President (Professor Wright) stressed the fact that he claimed no precedence in that matter. The treatment originated on the Continent and in this country Mr. W. A. Campbell had recorded his experiences in the *Veterinary Record*. In reply to Sir Frederick Hobday regarding the expense of treatment, insulin now cost approximately one shilling per hundred units, so that his pony, which had

1,000 units, cost 10s. to treat. The vanner, which had four doses of 150 units, cost 9s.

Captain L. S. Balls observed that he was very interested in "azoturia," and years ago he had a pony that suffered from the affection four times. On the occasion of the last attack he rode the pony home, when it was sweating profusely, and the animal again recovered. One would meet with it affecting the fore-quarters as well as the hind. If a horse had only one hind leg affected and did not go down it would recover, provided one put it in slings, though some muscle atrophy might ensue.

Mr. Perryman enquired if the President passed the catheter—or did the horse pass the urine without any help? In the case of a gelding it was a matter of great difficulty to pass the catheter in such cases, but if urine were not voided the animal became very restless; indeed it might even smash its head to pieces. He agreed that if "azoturia" occurred in both hind legs the chances of recovery were practically nil. He therefore thought that Professor Wright had rendered the Society a material service in bringing that treatment to their notice.

The President replied that the mare was catheterised for the purpose of confirming the diagnosis. A metal catheter which could easily be sterilised was employed. In the gelding no catheter was used, for he got on his feet to urinate. He (Professor Wright) never catheterised a male of any species if it could possibly be avoided. Other than by autoclaving there was no efficient way of sterilising gum elastic catheters. He did not believe that the horse's bladder would rupture; there would come a time when the pressure on the trigonum would provoke urination whether it was up or down, provided that the urethra was clear.

Mr. N. King enquired if the effect of the insulin in the President's cases was immediate, or if the drug was rather prolonged in its action.

The President replied that there was no immediate response: in his second case the animal was on its feet on the third morning.

HERD TESTING IN NOTTINGHAMSHIRE

At a meeting of the Nottinghamshire County Council, it was stated that six herds formerly tested by private practitioners approved by the Ministry of Health had been transferred to the control of the Council, and the committee recommended the appointment of a temporary veterinary officer at a salary of £450 per annum, rising by annual increments of £25 to £600.

Sir Joseph Nall moved an amendment to refer the matter back and explained that his object was to arrange for the testing of the herds referred to being done by local practitioners and to avoid the necessity of adding to the permanent staff.

After discussion the amendment was defeated and the report was adopted.

ABSTRACTS

[Rationale of Toxoid Therapy in Staphylococcal Infections, with Reference to Serologic Grouping of Staphylococci.* Blair, J. E.]

The use of staphylococcal toxoid in the therapy of staphylococcal infections has been reported by several investigators to be of definite value. It is reasonable to assume that toxoid therapy would be of benefit only in those infections due to toxigenic staphylococci. The greatest benefit appears to be obtained in the treatment of superficial staphylococcal infections. No apparent clinical improvement which could be attributed to the effect of toxoid was observed in a group of 38 patients with chronic staphylococcal osteomyelitis who were given a course of staphylococcal toxoid therapy by our associates.

By means of reciprocal agglutinin absorption tests we have been able to separate staphylococci from varied sources into several distinct serologic groups, which differ in their toxigenic capacities, and possibly in other manifestations of pathogenicity. Several strains from cases of osteomyelitis are placed in those groups which do not produce exotoxin.

It is suggested that the choice of antitoxic therapy, or of active immunisation by means of toxoid, in any given case may be guided by the type of staphylococcus aetiologically responsible. It is further suggested that failure to obtain beneficial results with staphylococcal toxoid therapy may be due in part to the fact that the staphylococcus in question produces its pathologic effect because of factors other than exotoxin; antitoxin, or immunisation with toxoid, in such a case would have no direct effect on the bacteria.

* * * * *

[Staphylococcus Toxoid.* Murray, D. S.]

Since publishing some results over a year ago (*Lancet*, 1935, I, 303), the speaker has continued to use staphylococcus toxoid in a large number and wide variety of cases. The favourable results already reported have continued, but the relapse rate over a longer period is fairly high. Most cases, however, respond to a second course. After using a variety of antigens it appears that a combination of an autogenous vaccine and staphylococcus toxoid in graduated doses gives a more satisfactory result.

* * * * *

[The Toxin of Cl. chauvoei.* Mason, J. H.]

A toxin has been demonstrated in filtrates of *Cl. chauvoei* cultures. The intradermic injection of filtrate into guinea-pigs has proved to be the

*Abstracts of communications made to the Second International Congress for Microbiology, London, July 25th-August 1st, 1936.

best method of demonstrating it, particularly if adrenalin is incorporated. This toxin is neutralisable by homologous antitoxin, by *Cl. septicum* antitoxin, and to a slight extent by the sera of some normal rabbits and bovines.

Two antigens are involved in the production of immunity to infection with *Cl. chauvoei, viz.*, (1) the heat-labile toxin or its atoxic modification (toxoid) contained in culture filtrates and formol-cultures, and (2) a heat-stable antigen contained in filtrates, formol-cultures and suspensions of boiled bacilli.

There is no correlation between the amount of circulating antitoxin in an animal and the power of the animal to resist living culture, but there is a correlation between the amount of circulating antitoxin and resistance to toxin, injected intravenously or intradermally. The evidence indicates that the heat-stable antigen is the more important in the production of immunity to infection with *Cl. chauvoei* culture.

* * * * *

[Contagious Pustular Dermatitis of Sheep: Vaccination. Glover, R. E. (1934-35.) Rept. Director, Inst. Anim. Path., Camb. **4.** 1-15.]

Many investigators have shown that sheep which have been artificially immunised against contagious pustular dermatitis are protected against subsequent infection. This paper shows that of 1,870 vaccinated lambs exposed to natural infection the incidence of the disease amounted to 6·8 per cent., whilst in 2,420 uninoculated animals maintained under similar conditions the disease incidence was 11·6 per cent. It is emphasised that the lesions in vaccinated lambs were distinctly milder and the mortality considerably lower than in the control group.

The vaccine was made from a virus obtained from a mild outbreak of dermatitis, and adequate supplies of this virus were collected by dermal passage in lambs. The crusts were removed at about the tenth day after artificial infection, dried and stored *in vacuo* at a low temperature. The resultant dry powder was emulsified in 25 per cent. glycerine saline solution to make a concentration of virus of 1 in 500; this was filtered through cotton-wool and 3 per cent. chloroform added as a preservative. In applying the vaccine an area of skin inside the thigh was cleansed and a superficial scarification about 1 in. in length was made with a sharp needle. A small cotton-wool swab soaked in vaccine was then drawn over the scratch.

This vaccine is suitable for fat lambs and adult sheep, but is considered unsuitable for very young lambs on account of the severity of the lesions which may be induced. Under natural conditions information was obtained that the progeny of ewes vaccinated during pregnancy might possess a slight degree of immunity. All attempts to produce immunity with inactivated virus were unsuccessful.

W. S. G.

* * * * *

[Observations and Experiments with Myxomatosis cuniculi (Sanarelli) to ascertain the Suitability of the Virus to Control the Rabbit Population. Martin, Charles J. (1934-35.) Rept. Director, Inst. Anim. Path., Camb. **4.** 16-38.]

For the control of vermin by means of a pathogenic microbe, one must be sought which possesses to the highest degree the following characteristics: (1) It produces a disease which is sufficiently infectious to spread throughout the population. (2) It has such virulence that few animals recover to build up gradually a resistant race. (3) It must maintain its virulence when passing from one animal to another by natural means or the epizoötic will "peter out." Should any animals recover and become immune to further infection, their progeny must not inherit sufficient resistance to escape infection. (4) It is specifically dangerous to the animal it is desired to exterminate and harmless for domestic animals. (5) It is not too troublesome to propagate, keep in an active condition and apply in practice.

Experimentation by the author with the virus of *Myxomatosis cuniculi* shows that a good strain of virus satisfies these requirements. With natural infection by contact, the fatality of the disease has been 100 per cent. on wild rabbits and 99 per cent. on domesticated varieties. The virus is highly specific for the genus *Oryctolagus*, to which the European and Australian wild rabbit and all the numerous domesticated varieties belong.

The immunity to myxomatosis of rabbits which have recovered from Shope's fibroma of cottontails is confirmed and shown to be reciprocal. The author makes an important alternative interpretation of the observations of Berry and Dedrick, whose experiments suggest that the virus of fibroma can be transmuted into the virus of myxomatosis. They heated an emulsion of tissues containing the virus of myxoma to 60° C. for 30 minutes. The heated virus failed to infect rabbits, but when some of this inactivated virus was mixed with fibroma virus and injected into the testicle of domestic rabbits, myxomatosis ensued in every case. When the myxoma virus had been heated to 90° C. a fibroma occurred.

Martin suggests that although the virus of myxoma has been inactivated by heating to 60° C. it need not be taken for granted that it is dead. It may be inactive because by this treatment it has lost something which is necessary for it to withstand the defences of the host and this may be re-acquired from the emulsion of fibromatous tissue containing the antigenically related fibroma virus. By this

REVIEW

[The Principles of Bacteriology and Immunity. By W. W. C. Topley (Professor of Bacteriology and Immunology, University of London; Director of the Division of Bacteriology and Immunology, London School of Hygiene and Tropical Medicine) and G. S. Wilson (Professor of Bacteriology as applied to Hygiene, University of London, London School of Hygiene and Tropical Medicine). Second edition. Pp. 1,645. Edward Arnold & Co., London. 50s.]

When "Topley and Wilson" first appeared some seven years ago, it was accepted as a standard work almost at once, and the second edition needs no recommendation to those who have learnt to appreciate the qualities of its predecessor. The second edition has been thoroughly revised and includes an adequate account of the most recent work. Whole chapters have been completely re-written and, where recent studies have greatly altered our conception of a particular bacterial group, and of the diseases caused by it, the authors have frankly adopted the form of an abbreviated monograph. And with much gain to the reader, who is piloted through a mass of often only partially connected data, old and new—sometimes controversial—to emerge with a clearer picture of the whole than would otherwise be possible. In fact, one of the characteristics of the work, apart from its fullness and accuracy and the conciseness of the systematic portions, is the way in which the literature essential to a given chapter is critically analysed and built up into a whole which not only leaves the reader with a clear conception of the existent state of knowledge on a particular subject and of the gaps which remain, but one which is essentially readable and witness to a lively faith in the future. Some sections, *e.g.*, that on the measurement of immunity reactions and on herd immunity, are in themselves notable additions to scientific knowledge and method. Minor errors or omissions are present in the chapters whose subject matter is best known to the reviewer and may possibly similarly be found by others, but they are few.

It may not be out of place to doubt the advantages of having produced the second edition in one volume, a change made apparently in response to the expressed wishes of many readers. It is true that previously those who wished to refer to a particular disease had often to turn up sections of two volumes. Nevertheless, it will generally be found that a given worker needs one or other volume at a given time. He has still, moreover, to turn up two pages of the same volume, whilst the size of the present volume is a serious disadvantage in that it makes it difficult to carry and less handy than is desirable for a work to which reference is so frequently made.

The work is intended firstly for medical bacteriologists, but more than usual attention is given to infective diseases of animals because, as the authors say, "the boundary between medical and veterinary science is becoming very indistinct . . . and the importance of animal diseases to the public health such that both the medical and veterinary bacteriologists will find themselves at a serious disadvantage unless each has some familiarity with the territory covered by the other." The authors have not attempted a complete account of the infective diseases of animals. Nevertheless, no reference work of equal value exists for the advanced veterinary student of bacteriology and immunity, whilst Part IV, "Application of Bacteriology to Hygiene," and also Part III, "Infection and Resistance," can be read with profit and pleasure by all who take serious interest in the methods of controlling infective diseases of animals.

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interpretation myxomatosis follows the injection of the mixture, not because the virus of fibroma is transmuted into the virus of myxoma but because a damaged myxoma virus is rehabilitated by the agency of the virus of fibroma or products of its disintegration.

The author concludes that it should not be difficult to exterminate individual colonies of rabbits by means of myxomatosis, but the readiness with which infection will spread to colonies in the neighbourhood depends not on the virus but upon the amount of intercourse between animals of the separated colonies.

W. S. G.

DEMAND FOR HEAVY HORSES

It was announced at the annual meeting of the Shire Horse Society, held at the Royal Agricultural Hall, Islington, that Lord Derby would be President of the Society for the ensuing year and that he would be succeeded in 1938 by Mr. J. Morris Belcher.

Mr. C. Barker, the retiring President, appealed to members to use their influence to increase the Society's membership. He referred to the high quality of the horses exhibited at this year's show, and said that breeders were producing what was wanted—active horses that were not too cumbersome. There was a demand to-day for heavy horses, particularly in the large towns. There were, however, far too many imported horses in use. There was plenty of room for more foals, and he suggested that local agricultural societies might help by hiring more stallions.

Mr. A. Thomas Loyd said that while they had to face the fact that the heavy horse did not occupy the place it had held in former years, a study of the results of sales showed that there was still a very great place for the heavy horse, and he was satisfied that the Shire could fill that place.

REPORTS

Proceedings under the Diseases of Animals Acts for the Year 1935*

PART I.—NEW LEGISLATION—THE DISEASES OF ANIMALS ACT, 1935

An important addition was made by the Diseases of Animals Act, 1935, to the code of laws dealing with animal diseases and related subjects. The new Act amended the Diseases of Animals Acts, 1894 to 1927, for two main purposes. Part I makes provision for the application of those Acts to poultry so as to empower the Minister of Agriculture and Fisheries to take such measures as may seem to him necessary and desirable for the suppression of contagious diseases in poultry. This part of the Act also includes (in Sections 7 to 9) certain other amendments of the Diseases of Animals Acts. Part II provides for the regulation of the manufacture for sale, and of the importation, of vaccines, sera and other therapeutic substances intended to be used solely for veterinary purposes.

Application of the Diseases of Animals Acts to Poultry

One of the purposes of the new Act is to provide means of preventing the introduction of, as well as a way of dealing drastically with, the most devastating virus diseases which, if allowed to spread, would be disastrous in their effects on the poultry industry. The most serious of these diseases are included in the group known as fowl pest, which term includes fowl plague and Newcastle disease.

The Ministry is empowered (Sections 2 and 4) to require compulsory notification of suspected cases of disease, and to carry out slaughter when it thinks necessary, and provision is made for the payment of compensation for any healthy poultry so slaughtered on account of their contact with infection to the extent of their full value. No compensation will be payable for diseased poultry.

The application of methods of compulsory notification or slaughter will not be extended to the diseases commonly existing in this country such as fowl-pox, bacillary white diarrhoea, fowl typhoid, tuberculosis, fowl cholera or contagious bronchitis (laryngo-tracheitis), or with respect to coccidiosis and the other parasitic infestations. Powers are conferred upon the Ministry to prohibit or regulate the importation of poultry or of eggs intended for hatching or the use of imported eggs for hatching, and the Ministry may also require imported poultry to be detained in quarantine where considered desirable.

Provision is made for the cleansing and disinfection of poultry crates and vehicles used for the conveyance or exposure for sale of poultry. The application of the Diseases of Animals Acts to poultry by Section 1 will enable Orders to be made for the cleansing and disinfection of poultry pens at markets.

Therapeutic Substances

The purpose of the Therapeutic Substances Act, 1925, was to control the manufacture for sale, and the importation of therapeutic substances intended for use in human medicine. Part II of the Act of 1935 is intended to serve a similar purpose in respect of biological products intended exclusively for use for veterinary purposes.

The substances to which the Act will apply are set out in the First Schedule thereto. Other substances may be added to the Schedule by an Order.

Provision is made for the issue, subject to certain conditions, of licences to manufacture for sale any therapeutic substance in relation to which an Order is in force. The Minister may revoke a licence in certain circumstances, and a person who is aggrieved by the revocation or suspension of his licence has the right to appeal to the court.

The preparations of a registered veterinary surgeon used for the treatment of any particular animal or poultry in his own professional care, are exempted in certain circumstances.

A licence to import veterinary therapeutic substances, subject to such conditions as may be prescribed by an Order, may be issued.

Other Amendments of the Diseases of Animals Acts contained in the Act of 1935

The Act provides covering statutory authority for the Ministry to provide or approve one or more quarantine stations for the reception, isolation and examination of animals or poultry before export, and to charge appropriate fees to be approved by the Treasury in respect of animals or poultry admitted to the station.

The Minister is empowered to adopt a policy of vaccination or serum treatment of animals exposed to infection in relation to any disease where the adoption of such a policy is considered to be effective, and thus partially to reduce the extent of slaughter necessary for the eradication of disease.

No compensation will be payable in respect of imported animals or poultry slaughtered on account of disease in a quarantine station nor for animals or poultry slaughtered for similar reasons in an export quarantine station.

*The proceedings may be obtained from H.M. Stationery Office or through any bookseller. Price 2s. net.

PART II.—INCIDENCE OF THE NOTIFIABLE CONTAGIOUS ANIMAL DISEASES IN GREAT BRITAIN

There were no cases recorded in Great Britain during 1935 of cattle plague, pleuropneumonia, sheep-pox, rabies, glanders, epizoötic lymphangitis or dourine.

Foot-and-mouth Disease

During the year 1935 there were 56 outbreaks of foot-and-mouth disease in Great Britain involving the slaughter of 2,900 cattle, 7,000 sheep, 2,543 pigs and 1 goat, and the payment of compensation amounting to £71,696 12s. 10d. There were 13 new centres of infection, the outbreaks being distributed among nine English counties, two Welsh counties and one Scottish county (Lanarkshire). Until disease appeared at Glasgow on January 17th, Scotland had been entirely free from the disease for a period of three-and-a-half years.

During the year there were twelve initial or "parent" outbreaks, that is, outbreaks in which there appears to have been no connection with any other centre of disease. The circumstances connected with these initial cases were exhaustively investigated, but without the source of infection being identified. Disease first appeared among cattle in nine of these cases and among pigs in the other three.

The English outbreaks included two extensive but unconnected series in Dorset, the first of which occurred in January and February and involved 15 different premises. The second Dorsetshire series involved ten separate premises and occurred in April and May. In February and March, three isolated and unconnected outbreaks took place in West Sussex, Oxfordshire and Surrey. Two outbreaks occurred in Rochdale, Lancashire, in June, and two in Warwickshire during September and October. Late in November two unconnected outbreaks were confirmed in Cheshire and East Sussex, while three outbreaks took place in Wiltshire in December (a further two outbreaks in the latter series occurred in January, 1936). The outbreak in Scotland took place during January and involved four separate premises in or near Glasgow. Of the outbreaks in Wales, twelve occurred in South Wales during September and October, while three outbreaks took place in Glamorgan in December (a further outbreak in the latter series occurred in January, 1936). In connection with the South Wales and Warwickshire outbreak in September and October, the Ministry, on September 25th, issued a special Notice to the Press drawing the attention of stock owners to the fact that four outbreaks of foot-and-mouth disease had been confirmed during that and the preceding day on widely separated premises (two in Glamorgan, one in Monmouthshire and the fourth in Warwickshire), all attributed to infection contracted at the market held at Newport on September 16th, and that in only one of these cases was the existence of disease reported by the owner of the animals.

There were, therefore, grounds for apprehension that infection might be more widely disseminated than was then known, and it was imperative for these reasons that every stock owner should keep a careful watch on the condition of health of his livestock and report without delay to the local police any suspicious symptoms in his animals. This notice was also broadcast the same evening in the News Bulletin of the British Broadcasting Corporation.

Serum Treatment.—The use of serum treatment in selected field outbreaks was continued experimentally during 1935 and was applied to two outbreaks. In all, 160 cattle and 10 pigs which were exposed to a risk of infection were treated with serum. In one case none of the treated animals became affected with disease, but in the other case where a valuable dairy herd of 87 cattle had been treated, disease appeared in a heifer which had probably contracted infection before the serum was administered. It was unfortunately necessary, in consequence, to slaughter the whole herd.

Bovine Tuberculosis

During the year disease was reported to exist on 25,032 premises in Great Britain, as compared with 24,512 premises in the previous year. The number of animals examined on those premises by veterinary inspectors of the local authorities was 415,667 against 393,343 in 1934. As a result of such examination, 22,333 cattle (on 20,615 premises) were declared to fall within the scope of the provisions of the Order relating to compulsory slaughter, an increase of 153 animals on the figure for the previous year. The total comprised 16,311 cows in milk, 5,387 other cows and heifers and 635 other bovines. The forms of the disease with which the animals concerned were suspected to be affected were: (1) giving tuberculous milk, 861 animals; (2) tuberculosis of the udder, 4,083 animals; (3) tuberculous emaciation, 5,915 animals; (4) chronic cough accompanied by other clinical signs of tuberculosis, 11,474 animals.

The results of ten full years' administration of the Order show that in 1926 and 1927 about 17,600 animals per annum were declared to fall within the scope of the Order; thereafter there was an annual decline in the totals until 1930, when less than 15,500 animals were dealt with. Since 1930, however, there has been an annual increase up to the figures of over 22,000 for 1934 and 1935.

During the ten years, the proportion of emaciation cases has fallen gradually from rather more than one-half to only a little more than one-quarter, whilst other categories have

fairly consistently increased. The obvious inference is that cases are being reported or detected each year at an earlier stage, owing to the institution of periodical routine inspection of dairy herds by local authorities, and the increasing activity of public health officials in tracing samples of tuberculous milk back to the cows which produced the milk. Local authorities were not called upon to slaughter the whole of the 22,333 animals, as a small number died or were slaughtered by their owners. Local authorities slaughtered 22,237 animals in respect of which compensation amounting to £85,826 0s. 5d. was paid, or an average per animal of £3 17s. 2d.

Local authorities are entitled under the Diseases of Animals Act, 1925, to claim from the Ministry a refund equal to 75 per cent. of the gross amount disbursed by them in compensation to owners of slaughtered animals, and the amount so refunded during the year 1935 was £64,370, compared with £58,558 in 1934. The remaining £21,456 was borne by the local authorities from the salvage of the carcases of slaughtered cattle, which amounted to £17,010.

Notice of objection to the slaughter of animals was given by owners during the year in respect of 17 cattle, and as required by the Order these cases were referred to the Ministry for decision. In eleven cases the Ministry authorised the slaughter of the animals, in three cases the objections were upheld, whilst in one case the animal died. The remaining two cases concerned animals of high value, and the Ministry decided that they should not be slaughtered, but should be kept under restrictions imposed and maintained by the local authority.

Summary of Results of Administration of the Tuberculosis Order During 1935.—On the 25,032 premises in Great Britain on which disease was reported to exist or on which cows were reported to be giving tuberculous milk, there were 883,129 bovine animals, including 673,585 cows and heifers. Of these, 355,347 cows and heifers and 60,320 other bovine animals or a total of 415,667 animals, were examined. *Post-mortem* examination showed that 22,144, or 2·5 per cent. of the total number of bovine animals on the premises, were found to be affected with one of the forms of tuberculosis dealt with in the Order. Of the animals actually examined, 5·3 per cent. were so affected as to come within the scope of the Order. The number of cows and heifers certified to be affected was 21,528, and of these 5,923 were stated to be affected with tuberculosis of the udder or giving tuberculous milk. The latter number represents 0·88 per cent. of the total number of cows and heifers on the inspected premises and 1·67 per cent. of the number of cows and heifers actually examined on these premises.

Tuberculosis (Attested Herds) Scheme.—By Section 9 of the Milk Act, 1934, the Minister of Agriculture and Fisheries and the Secretary of State for Scotland were empowered to make "arrangements," with the approval of the Treasury, for the expenditure of sums not exceeding £750,000 spread over a period of four years to assist in "securing so far as practicable that the milk supplied for human consumption . . . is pure and free from the infection of any disease."

In the exercise of these powers "arrangements" were made by the Ministry in 1935 which fall under two heads:—

(i) the institution of the Tuberculosis (Attested Herds) Scheme for England and Wales; and

(ii) research, to be carried out partly at the Field Laboratories by the Institute of Animal Pathology, Cambridge, and partly at the Ministry's Veterinary Laboratory, New Haw, Weybridge, Surrey, into the application of the tuberculin test for the purpose of solving certain difficulties in interpreting the test which had arisen in a small percentage of cases. No report on this work was available up to the end of the year.

The Attested Herds Scheme came into operation on February 1st, 1935, from which date the four years period commenced. A similar scheme applicable to Scotland came into operation simultaneously. The object of the scheme is to establish in a practical manner an official register of tubercle-free herds which will form a nucleus capable of gradual expansion.

Anticipated Benefits of the Scheme.—The financial inducements offered by the scheme and the benefits resulting to an owner successfully undertaking the task of qualifying for a Certificate of Attestation were:—

(*a*) a bonus of 1d. per gallon for milk produced from an attested herd and sold through the marketing provisions of the Milk Marketing Scheme;

(*b*) free official tests, including the periodical official tests which follow certification and are a necessary condition of renewal of a certificate (renewal tests are required at intervals of either six or twelve months according to the circumstances);

(*c*) the certainty of an enhanced market price for animals from an attested herd;

(*d*) an improvement in the stamina of the herd, including increased milk yield and greater freedom from other diseases;

(*e*) the prolongation of the average life of an animal in an attested herd.

Results of the Scheme.—The results obtained from the working of the scheme in 1935 were far from satisfactory. Only 55 herds in England and Wales, comprising 2,108 cattle, had been

added to the Register up to December 31st, 1935, and by March 31st, 1936, after the scheme had been in operation for one year and two months, the figures had only reached 81 herds, comprising 3,284 cattle. Up to December 31st, 1935, the amount of the bonus earned in respect of milk from attested herds was only £770, the smallness of this figure being in part, however, due to the short period during which many of the attested herds had been on the Register.

Of the 81 attested herds on March 31st, 1936, 28 were herds licensed by the Ministry of Health to produce certified or grade A (tuberculin tested) milk.

Publication of Register of Attested Herds.—The Register of Attested Herds was first published on August 31st, 1935, and then included 31 herds in England and Wales. By arrangement with the Department of Agriculture for Scotland the Register included also the herds in Scotland attested under the Scottish scheme, of which there were 27 on August 31st, 1935. A revised Register was published on March 31st, 1936, containing 81 attested herds in England and Scotland, comprising 3,284 cattle, or an average of 40 cattle per herd, and 88 attested herds in Scotland, comprising 6,922 cattle, or an average of 79 cattle per herd. There was, therefore, a total of 169 attested herds in Great Britain, comprising 10,206 cattle, on the Register on March 31st, 1936.

Criticisms of the Scheme.—Criticisms of the Attested Herds Scheme were received at an early stage from various societies and individuals interested.

These were carefully considered by the Ministry, and it was announced in Parliament that certain proposals for the amendment of the scheme would be framed and that agricultural bodies concerned would be consulted thereon.

Sheep Scab

There were 477 outbreaks in Great Britain during the year 1935, a decrease of 207, or 30·3 per cent., on the figure of 684 for 1934, and a decrease of 101, or 17·5 per cent., on the figure of 578 for 1933.

The actual figures for the three countries, as compared with 1934, are as follows: England 335, a decrease of 156; Wales 102, a decrease of 29; Scotland 40, a decrease of 22.

Of the outbreaks in England, 187, or 56 per cent., occurred in those counties bordering the Pennine Range, *viz.*, Cumberland, Derby, Durham, Lancashire, Westmorland, Yorkshire (North Riding) and Yorkshire (West Riding). Outbreaks which occurred in the remainder of the country numbered 148. With the exception of Durham all counties in the Pennine Range group showed substantial decreases.

The policy commenced in 1933 and intensified in 1934 by the Pennine Range (Movement of Sheep) Order of 1934, was continued in 1935. By the end of the first quarter of 1935, the position in Areas Nos. 2 and 5 had so improved as to justify their release from the provisions of the Order and this was accordingly done by the issue of an Order on April 26th, 1935.

Area No. 3 (Derbyshire) was released from the Pennine Range Order on October 1st by an Order (No. 5,353) issued on September 26th.

Since movement restrictions were removed from No. 3 Area, the Derbyshire local authority have made regulations to prevent the re-introduction of disease into the Peak District of the country.

At the end of the double dipping periods the position with regard to the remaining areas, Nos. 1 and 4, was reviewed and it was decided to release them. This was accordingly done by the revocation of the Pennine Range (Movement of Sheep) Order to take effect on November 8th, 1935. Certain areas were, however, placed under Form G restrictions, as a preventive measure.

In the other counties of England 148 outbreaks of disease were confirmed, representing an increase of 58 outbreaks when compared with the 1934 figure of 90. As in 1934, 19 counties were involved. Increases in outbreaks were noticeable in Essex, Lindsey, Nottingham, Oxford, Suffolk, Warwick and Yorkshire (East Riding), while Cheshire, Kesteven, Salop and Stafford showed decreases.

In the Midland and Southern group of counties in England, which have combined to make regulations requiring the double dipping of sheep moved into their districts from elsewhere, there were 115 outbreaks in 16 counties as compared with 67 outbreaks in 16 counties during 1934.

In Wales, 102 outbreaks were confirmed, compared with 131 in 1934. Of these, 95 occurred in the North Wales counties of Anglesey, Caernarvon, Denbigh, Flint, Merioneth and Montgomery. Decreases were noted in all of these counties, with the exception of Montgomery, which showed an increase of seven.

The serious position of the county of Merioneth with respect to sheep scab had caused grave concern to the Ministry for some time and the Merionethshire (Movement of Sheep) Order of 1935 was accordingly issued on September 21st, 1935, controlling the movement of all sheep out of the county of Merioneth.

Part III of the Sheep Scab Order of 1928 (Provisions applicable to Double Dipping Areas) was also applied to the county of Merioneth by a further Order requiring the double dipping of all sheep in the county between October 15th and December 15th.

A total of 40 outbreaks occurred in Scotland during 1935, involving eight counties.

Ten outbreaks occurred in the Outer Hebrides and the remaining 30 on the mainland. In 1934

there were only ten outbreaks on the mainland, but 52 in the Outer Hebrides.

Of the mainland outbreaks the most serious group was discovered in July on unfenced, open mountainous land to the south of Dalmally in Argyllshire, extending into the counties of Perth and Dumbarton, and special procedure under Article 14 of the Sheep Scab Order of 1928 was adopted to deal vigorously with the position in Dumbarton and Argyll.

All the ten outbreaks in the Outer Hebrides occurred in North Uist and adjacent smaller islands and arose from old-standing infection on the islands, particularly in the common grazings of North Uist.

Thirty-one sheep dips were approved during 1935, and there were 306 approved dips on December 31st, 1935, of which 201 were tar acid dips, 91 arsenic dips, 3 lime and sulphur dips, 1 soda sulphide dip and 1 tobacco dip.

Swine Fever

The number of suspected outbreaks of swine fever reported during the year was 15,541. Of these, 2,049 (13·2 per cent.) were confirmed after veterinary examination on the premises and at the Ministry's Laboratory.

The outbreaks in 1935 were distributed as follows: England 1,890 (increase of 194 outbreaks), Scotland 45 (increase of 19 outbreaks), Wales 114 (increase of 3 outbreaks). In 1,346 (65·7 per cent.) of the confirmed outbreaks in 1935, the diagnosis was established at the first visit. In the remaining 703 cases (34·3 per cent.) two or more visits were necessary to establish the existence of the disease. The number of swine slaughtered by the Ministry's inspectors for diagnostic purposes in connection with all reported outbreaks investigated during the year was 3,602 and the compensation paid to the owners amounted to £2,821.

The distribution of the outbreaks in 1935 in the various counties is shown in the tables in the Appendix. The counties worst affected were: Cornwall (99), Gloucester (188), Hereford (68), Kent (83), Lancaster (94), Lincoln, Lindsey (62), Norfolk (109), Somerset (84), Stafford (71), Suffolk (56), Surrey (56), and Yorkshire, West Riding (104). In Scotland, 12 of the total of 45 outbreaks occurred in Lanarkshire, and 5 in each of the counties of Angus, Perthshire and Stirlingshire. In Wales, 48 of the 114 outbreaks occurred in Glamorgan and 38 in Monmouth. The history of the affected swine was traced by inspectors of the Ministry in 1,815 outbreaks, or 88·6 per cent. of the total. These inquiries showed that 415 outbreaks (20·2 per cent.) were due directly to market infection or to infection during conveyance to or from markets, and that in 615 other outbreaks (30·0 per cent.) the affected swine had recently passed through a market and may thus have become infected.

Swine Erysipelas.—During the year under review there were 2,617 cases which had been reported as suspected swine fever and in which the veterinary inspector making the diagnostic inquiry suspected the cause of illness or death to be swine erysipelas; on further investigation, the diagnosis in 2,348 of these cases was found to be definitely swine erysipelas and in a proportion of these the diagnosis was confirmed on examination of material submitted to the Ministry's Veterinary Laboratory, New Haw, Weybridge.

Anthrax

During the calendar year 1935, material from 524 suspected outbreaks was submitted and the existence of anthrax was confirmed in 386 cases, or 73·7 per cent., as compared with 395 confirmed during 1934. Of the 386 outbreaks, 233 occurred in England, 149 in Scotland, and 4 in Wales.

The species and numbers of animals attacked were: cattle, 418; sheep, 6; swine, 15; horse, 1; canine, 1; and mink, 2, making a total of 443 animals, or an average of 1·15 deaths per outbreak.

Disease was confirmed twice on each of 13 premises and three times on each of three other premises, *i.e.*, 19 outbreaks on 16 premises may have arisen from a previous outbreak during the same year.

In addition there were 47 outbreaks on premises where disease was known to have existed during the previous five years, making a total of 66 possible recurrences in 1935 compared with 53 in 1934.

The 320 outbreaks unconnected with any previous case may have originated from the following sources: (1) effluent from tanyards, or other similar industrial undertakings causing contamination of streams, etc., 9; (2) feeding infected carcases or offals to animals, 2; (3) use of imported feeding stuffs, 208; (4) use of artificial manure of animal origin on the land, 25; (5) simultaneous use of both imported feeding stuffs and artificial manures, 49; (6) no explanation available, 27.

Parasitic Mange in Equine Animals

The prevalence of this disease continues to decline. During the year under review 99 outbreaks in 32 counties were reported by local authorities in Great Britain, a decrease of 13·9 per cent. on 1934. The number of horses attacked in 1935 was 222, as against 191 in 1934.

In England the number of counties involved was 29 and the outbreaks decreased from 109 to 92. The county of Norfolk again had the largest number of outbreaks (12), but this was a considerable improvement on 1934, when 20 outbreaks occurred. Other counties with appreciable decreases were Isle of Ely (7 to 1),

Essex (10 to 5), Hertford (3 to nil), Kent (7 to 4), Lancaster (12 to 8), Salop (3 to nil) and Warwick (3 to nil). Counties with increases included Durham (nil to 3), Lincoln (Lindsey) (2 to 5), London (1 to 4), Northumberland (nil to 3), Stafford (1 to 5) and East Sussex (1 to 4).

In Wales, for the second year in succession, no outbreaks were reported.

In Scotland three outbreaks occurred in three counties as compared with six outbreaks in three counties in 1934. Only one outbreak occurred in the county of Dumfries as against four in 1934, the other two outbreaks being in the counties of Argyll and Berwick.

PART III.—PREVENTIVE DISEASE MEASURES—IMPORTATION OF ANIMALS, ETC.

The following table shows the various animals imported from Ireland, Channel Islands, Isle of Man and Canada during 1935.

County of Origin.	Cattle.	Sheep.	Swine.	Goats.	Total.
Ireland ...	851,464	471,199	207,161	12	1,529,836
Channel Islands	1,999	—	—	—	1,999
Isle of Man ...	248	5,021	286	—	5,555
Canada ...	7,110	—	5	—	7,115
	860,821	476,220	207,452	12	1,544,505

All these animals were required to be detained in the landing place for at least ten hours for rest and veterinary examination before being licensed to their intended place of destination.

Importation of Pedigree Animals

Friesian Cattle from Holland.—For some years the British Friesian Cattle Society has been anxious to import fresh stock from Holland for the purpose of improving the butter-fat content of the milk of the home strain, and on November 25th the Minister made an Order under Section 27 of the Diseases of Animals Act, 1894, authorising under certain conditions the importation into this country from Holland of a consignment of 100 or thereabouts pedigree Friesian cattle, the property of the British Friesian Cattle Society.

One hundred and two cattle (42 bulls, 59 cows and heifers and 1 calf) were landed at Harwich under the above-mentioned conditions on January 5th, 1936. One bull reacted to the tuberculin test and was re-exported, and two cows and two heifers failed to pass the epizoötic abortion test and were also re-exported. Of the remaining 97 animals, 95 were released on February 3rd and two on February 17th.

Importation of Dogs and Cats—Quarantine Regulations

The Importation of Dogs and Cats Order of 1928 requires all canine and feline animals imported into Great Britain from abroad to be detained and isolated on veterinary premises approved by the Ministry for a period of six calendar months.

The number of canines and felines imported during the year was 1,142, consisting of 916 domestic dogs, 59 domestic cats, 58 canines and 109 felines. Of the above animals, 53 were performing dogs and cats, and 31 of the canines were silver foxes imported for breeding purposes.

Five dogs were landed in contravention of the Order by three owners and in two cases legal proceedings were instituted and fines imposed, but in no case was there any attempt to smuggle the dogs.

Disease in Imported Animals. Cases of Scheduled Disease found in Imported Animals in the Landing Places.—Twenty-two cows, all from the Irish Free State, were detained for examination, suffering from induration of the udder. None of these cases was considered by veterinary inspectors to come within the scope of the Tuberculosis Order of 1925, and the animals were released.

The only cases of a scheduled (notifiable) disease detected in the landing places amongst imported animals were 54 cases of sheep scab, which were discovered in 40 cargoes of sheep from Ireland.

Foreign Hay and Straw Orders.—The countries from which hay and straw could be imported into Great Britain without restrictions at the end of the year were: Ireland, the Channel Islands, the Isle of Man, Canada, Australia, New Zealand, Union of South Africa (including the Mandated Territory of South-West Africa), Finland, Norway, Sweden and the United States of America.

Markets, Sales and Lairs Orders.—These Orders, imposing certain requirements as to the paving, cleansing, disinfection of markets, sale-yards and lairs used for animals, continued in force unchanged during the year.

Diseases of Animals (Disinfection) Order.—Eight new disinfectants were approved in the course of the year, and the approvals of five other disinfectants were withdrawn. On December 31st, 1935, the total number of approved disinfectants was 129, manufactured by 84 different firms. These disinfectants are also sold by other vendors under their own names, and at the end of the year there were 513 separate labels approved by the Ministry for affixing to receptacles containing approved disinfectants.

PART IV.—PROTECTION OF ANIMALS AND POULTRY DURING TRANSIT BY SEA, RAIL AND ROAD

Sea Transport.—During the year 102 vessels continued to be engaged in the cattle carrying trade between Great Britain, Ireland, the Isle of Man and the Channel Islands, and coastwise in Great Britain.

The numbers of animals carried by sea and the number of casualties amongst them were: Irish trade: cattle 851,464 (total casualties 121), sheep 471,199 (total casualties 91), swine 207,161 (total casualties 139); Channel Islands trade: cattle 1,999 (casualties nil); Isle of Man trade: cattle 248, sheep 5,021, swine 286 (casualties nil); Canadian trade: cattle 7,110 (total casualties 63).

Exportation of Horses.—The number of horses exported to Europe during 1935 was 2,670, of which 136 went to Belgium, 80 to Denmark, 400 to France, 31 to Germany, 533 to the Netherlands, 77 to Italy, 1,341 to Switzerland and 72 to other countries. In addition 12 horses were exported with certificates issued by the Jockey Club in the cases of thoroughbred horses shipped to the Continent for racing or breeding purposes.

PART V.—CERTIFICATION OF EXPORTED PEDIGREE AND OTHER LIVESTOCK AND RAW ANIMAL PRODUCTS TO COMPLY WITH REGULATIONS OF IMPORTING COUNTRIES

(1) Certification by the Ministry's Inspectorate

(*a*) *London Quarantine Station.*—During the year 565 animals were exported through the station, of which 181 were cattle, 326 sheep, 5 goats and 53 swine. Totals were: 119 animals to Australia, 97 to Canada, 26 to the Irish Free State, 2 to Southern Rhodesia, 319 to Union of South Africa, and 2 to Trinidad.

Revised regulations of the Commonwealth Government of Australia became operative towards the end of the year, and cattle are required to be accompanied by a johnin test certificate in addition to a tuberculin test certificate. The double intradermal method is prescribed for both tests and these must be carried out under the Ministry's authority.

The Canadian regulations were also revised; all cattle six months old and over are required to be tested for contagious abortion as well as for tuberculosis, under the Ministry's authority.

The New Zealand Government still maintained an embargo on the direct importation of ruminants and swine from this country.

(*b*) *Certification of Sterilising, etc., Plants.*—In connection with the exportation of fertilisers and feeding stuffs containing matter derived from animals, the Ministry is required to approve the factory of origin by annual inspection in accordance with the import regulations of certain other countries. The Ministry's veterinary inspectors carried out 62 inspections during the year, one less than in 1934.

(2) Certification of Districts of Origin of Animals and Products

The number of certificates issued by the Ministry during the year in respect of the freedom of the districts of origin of animals or products from animal diseases was 881, of which 315 were for horses, 65 for cattle, 50 for sheep, 1 for goats, 26 for swine, 134 for dogs, 1 for cats and 2 for other animals, while 179 were for poultry, hatching eggs and cage birds, 86 for forage and 22 for miscellaneous animals, etc., products.

(3) Certification by Veterinary Surgeons Nominated by the Ministry

The certificates issued were chiefly in respect of the disinfection of hay and straw for packing; the general health of particular livestock of all kinds; tests with mallein, tuberculin and johnin; agglutination tests for contagious abortion in cattle; tests for bacillary white diarrhoea and fowl typhoid in poultry; sausage casings and horse flesh (*ante-* and *post-mortem* examination of the animals).

Import Regulations of Dominions, Colonies and Foreign Countries.—Information is received by the Ministry through official channels as to the import regulations of other countries, British and foreign, relating to animals, animal products, poultry, etc., and this information is summarised and made available for the use of intending exporters.

PART VI.—MISCELLANEOUS

The International Veterinary Bureau

The Ministry was represented by Captain W. G. Wragg, M.R.C.V.S., Chief Superintending Veterinary Inspector, at the annual meeting of the Committee of the International Office of Contagious Diseases of Animals (l'Office International des Epizooties) held at Paris in May, 1935.

The papers discussed included one on immunisation against swine fever in Japan and another on vaccination against rabies in Morocco.

In the discussion on vaccination against swine fever by the simultaneous method there was general agreement that active immunisation should not be carried out in areas free from the disease. It was also agreed that vaccination could only be regarded as complementary to sanitary police measures.

In the discussion on vaccination against rabies it was generally agreed that whenever possible radical measures such as those successfully adopted in this country in the past were desirable, but that where such measures are

not found practicable vaccination could be usefully adopted as a measure for limiting the spread of disease where it exists.

Warble Fly (Dressing of Cattle) Order of 1936

At a conference held on December 3rd, 1935, attended by representatives of the Ministry of Agriculture and Fisheries, the Department of Agriculture for Scotland, the Ministry of Agriculture for Northern Ireland, and the Ministry of Agriculture of the Irish Free State, agreement was reached in principle on the desirability of the issue of an Order simultaneously in each country requiring the compulsory periodical treatment of cattle infested with warbles. Assurances were subsequently received from the Governments of Northern Ireland and the Irish Free State that, in the event of an Order being made by the Ministry to operate in Great Britain, similar measures would, at the same time, be adopted in Northern Ireland and the Irish Free State.

An Order in pursuance of the powers contained in Section 22 of the Diseases of Animals Act, 1894, was accordingly issued by the Ministry as regards Great Britain on January 31st, 1936. Orders containing provisions of a similar character were at the same time issued by the Ministries of Northern Ireland and the Irish Free State as agreed.

The effect of the Great Britain Order is to require the treatment of all visibly infested cattle by one of two alternative methods, namely:—

(1) the dressing of infested cattle with a dressing consisting of a derris preparation prepared in accordance with the specification laid down in the Schedule to the Order, at monthly intervals from March to June, until the maggots cease to appear; or alternatively

(2) the removal and effective destruction of all ripe maggots from the backs of infested cattle by squeezing out, or other mechanical means, at intervals not exceeding ten days during the months of March to June, until the maggots cease to appear.

Treatment by either of these two methods is not required after June 30th in any calendar year.

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Report of the Director of the Laboratory, Weybridge

(a) ROUTINE SERVICES

Examination of Specimens for Diagnosis

The following is a list of specimens received at the Laboratory for purposes of diagnosis in suspected cases of the diseases dealt with under the Diseases of Animals Acts in which the diagnosis rested with the Ministry:—

Diseases	*Positive*	*Negative*	*Total*
Swine fever	2,178	2,782	4,960
Anthrax	443	174	617
Sheep scab	76	15	91
Rabies	—	10	10

In addition to the above, 4,787 specimens were received which were not suspected of being connected with any of the diseases dealt with under the Diseases of Animals Acts.

Anthrax.—The following table shows the number of positive and negative results of the diagnosis at the Laboratory in relation to the different kinds of animals from which material was sent:—

Animals	*Positive*	*Negative*	*Total*
Bovines	418	130	548
Horses	1	4	5
Pigs	15	36	51
Sheep	6	3	9
Dogs	1	—	1
Other animals (mink)	2	1	3
			617

During the year 20,775 doses of anti-abortion "A" vaccine were supplied to veterinary surgeons for the inoculation of animals in herds affected with epizoötic abortion. The number of agglutination tests carried out in connection with bovine abortion was 1,166.

The preparation of Calmette-Guérin vaccine was continued and 693 doses were issued for inoculation of selected herds.

The number of poultry agglutination tests (*S. pullorum* infection) conducted was 203,088.

Vaccine was issued for the inoculation of 321,782 poultry against fowl-pox.

The number of doses of avian typhoid vaccine issued was 11,438.

Nine cattle were immunised against piroplasmosis and anaplasmosis prior to export to Egypt, Kenya Colony and the West Indies.

(b) RESEARCH

(1) *Contagious Abortion.*—The investigation of the distribution of *Brucella abortus* infection in the body of the "carrier" cow was concluded and published.

(2) *Tuberculosis.*—During the year a considerable amount of work was carried out on the relative value of different methods of tuberculin testing cattle.

A number of cases of avian infection were encountered in bovines, and also a few cases of the so-called "skin tuberculosis."

(3) *Parasitic Gastritis of Sheep.*—A study was made of the influence of the structure of herbage plants on the facility with which the worm larvae can ascend them.

Further work was done on the enumeration of parasitic worms as an aid to diagnosis.

(4) *Acute Parasitic Bronchitis in Adult Cattle.*—Several outbreaks of this condition were investigated, and Channel Island cattle appeared to be particularly susceptible.

(5) *Metabolic Disorders of Farm Animals.*—The study of this group of conditions was continued, and a considerable mass of data acquired concerning their occurrence in many different counties of England.

(6) *The Physiology of Certain Metals.*—In connection with the above-mentioned study of metabolic disorders, observations were made on the fate in the animal body of parenterally introduced salts of calcium and magnesium.

(7) *Newcastle Disease in Fowls.*—The results of a further study of this disease confirmed previous observations on the differences between Newcastle disease and fowl plague.

(8) *Infectious Laryngo-tracheitis of Fowls.*—This disease was not known to occur in Great Britain until an outbreak in Norfolk was diagnosed at Weybridge in January, 1935.

It was afterwards found that the disease occurs in many different counties in England. It sometimes causes serious mortality, particularly in fattening establishments, but in other instances the losses are insignificant.

G. M. F.

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Agricultural Research in Scotland in 1935*

[A brief summary of the work at the Agricultural Research Stations, in continuation of the summary which appeared in the *Veterinary Record*, 1935, Volume 15, p. 1348.]

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Institute of Animal Genetics
(University of Edinburgh, West Mains Road)

An Experimental Analysis of the Genetical Basis of Milk Yield.—The first of the experimental heifers are now completing their lactations. Some are sired by a dairy bull out of beef cows, others by a beef bull out of dairy cows. Preliminary results tentatively suggest that the latter group possess a higher capacity for milk production (thus indicating the importance of the dam in selection). Young stock are growing up which will enable these results to be checked.

At the farm of Cockburn, where a pedigree herd of cows is maintained, the progeny of six different bulls is being examined. The milk yield of the daughters is being calculated on three lactations. The animals are now entering on their third lactation.

Routine records are being maintained regarding the progeny of eight boars.

A strong and vigorous strain of Rex rabbits has been established. The waved coat is somewhat similar to Astrakhan and not unlike the waved character of the mouse and rat, behaving as a simple recessive.

The progeny of hens habitually laying small eggs mated to a cock from a large egg strain produces eggs of an intermediate size. An experiment to obtain information concerning the inheritance of egg size is being carried out. The development of a strain of Brown Leghorns which lay for a period of two years without moulting is meeting with some success.

Attempts are being made to find a test for the diagnosis of pregnancy in the cow similar to that used in the mare.

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Animal Diseases Research Association
(Moredun Institute, Gilmerton, Midlothian)

Louping-ill.—Vaccination against the disease has shown satisfactory results and the vaccine is now issued as a commercial product, 56,000 doses being issued in 1935.

Tick-borne fever is still under investigation.

Braxy vaccine continues to prove efficient.

A number of braxy-like diseases are under investigation and a considerable amount of work on the toxins of the *Cl. welchii* group is in progress.

Grass Sickness.—The inquiry has as its special purpose the determination and identification of toxins present in peracute cases of the disease. The investigation is being continued along these lines.

The study of contagious abortion in small animals continues. Much valuable information has been obtained but a dead vaccine capable of affording definite protection has not so far been found.

Enzootic abortion in ewes continues to be the subject of biochemical study. Although various mineral and food factors have been tried to control this disease, definite information as to its cause is still lacking.

The cause of lactation tetany has been proved to be a magnesium deficiency in the blood. In this connection magnesium metabolism experiments are being carried out in sheep and rabbits.

Controlled field experiments to determine the value of feeding vitamin A to young calves for the prevention of white scour are in progress.

Pine in the western islands appears to be a nutritional anaemia, which may be cured or prevented by administration of iron. A similar condition has been proved to occur in the neighbourhood of the Cromarty Firth. In Roxburghshire the evidence strongly suggests

*Notice prepared from a review of this subject appearing in the *Transactions of the Highland and Agricultural Society of Scotland*, (1936.) Vol. xlvii.

that the condition known as Cheviot pine is a form of chlorosis which responds to administration of assimilable iron compounds.

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The Rowett Research Institute (Bucksburn, Aberdeen)

Fodder Crop Conservation.—Further investigations on dried grass have been carried out. Sheep at Duthie Farm and Garrochoran, Argyll, were fed on cubed dried grass. Forty gimmers were wintered on pasture with dried grass as the only supplement. These compared favourably with some that had been fed with meals, hay, kale and roots. Those at Garrochoran have, up to date, done well. The method of cubing results in a decrease in wastage and, on the whole, dried grass shows distinct possibilities as a winter food for breeding sheep.

At the request of the Milk Marketing Boards, an experiment is being carried out to see whether pasteurisation has any ill effects on the nutritional value of milk for calves. The results are not conclusive and a further experiment is in progress. The difference in nutritional value of pasteurised and unpasteurised milk cannot be a large one. There appears to be a greater difference between the nutritional value of highest grade milk and ordinary unpasteurised milk. The growth of calves on graded milk was considerably better.

Experiments are in progress on the control of contagious bovine abortion. Feeding iodine as a preventive measure has given inconclusive results. Control by segregation and isolation with disposal of reactors has given results of doubtful practical utility in areas where very few herds are self-contained. A dead vaccine prepared by the veterinary officers in Northern Ireland is being tested but no results are yet available.

In pigs, experiments are in progress to determine the optimum rate at which the ration should be increased in rearing these animals.

Experiments in the nutrition of poultry have been somewhat disorganised owing to an outbreak of fowl paralysis. Advantage has been taken of this epidemic to study the effect of nutrition upon it. None of the nutritional measures applied had any significant effect on the control of the disease.

Experiments on the control of internal parasites in sheep have been continued. Salting pasture was found ineffective in controlling the smaller types of stomach worm.

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The Scottish Plant Breeding Station (Craigs House, Corstorphine, Edinburgh)

Experimental work is in progress with grain crops, potatoes, herbage plants and swedes.

Oats.—Varieties adapted to different conditions of soil and climate are being studied. A new variety known as "Early Miller" gave a yield of 35 hundredweights per acre in a 26 acre field in West Lothian. In Fife a yield of about 36 hundredweights of grain per acre was reported.

Barley.—A scheme for the improvement of common Scotch barley by the method of single plant selection is in progress.

Field Beans.—Varieties of field beans have been grown for observation. Single plant selections have been made from these to ascertain whether any improved strains may be evolved simply by selection.

Soya Beans.—Hardier varieties are becoming available for cultivation in cooler areas and small quantities of seed are being tested to see if any types might be adapted for cultivation under Scottish conditions.

Maize.—No variety of maize has so far been found which is suitable for general cultivation in Scotland.

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The West of Scotland Agricultural College

Proven Sires.—From work done it would appear that in picking a bull which it is hoped will become a proven sire it should be established that he has first of all a proven sire and then a proven paternal grandsire. A list of living proven Ayrshire sires has been prepared and it has been found that one of these bulls when mated with cows averaging 850 gallons of milk sired daughters which yielded 25 per cent. more milk and 44 per cent. more butter fat.

Succulent Feeds.—It has been found that there is not much difference in the value of the different succulent feeds. Choice between them depends on the cost of production or purchase.

In the milk utilisation department the question of mastitis infection is being studied with particular reference to the effects this disease may have in tainting butter and cheese prepared from milk obtained from infected cows.

The relative accuracy of the methylene blue reduction test for determining the market quality of milk was studied. Comparative trials at the West of Scotland Agricultural College indicated that the plate count, carefully determined, is a more reliable method of grading milk than the reductase test.

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The Hannah Dairy Research Institute (Kirkhill, Ayr)

Work on nutrition is being carried on and investigations have been made into the protein requirements of milk cows. Some progress has been made in an attempt to elucidate the

means by which the food constituents are transformed into milk.

Excellent results have been maintained in the scheme for the eradication of tuberculosis. One-third of the 200 herds within a five-mile radius are free from the disease and the other herds are making progress in eradicating the disease.

In co-operation with the Scottish Board of Research in Veterinary Science, investigations into contagious abortion and mastitis are in progress. Segregation methods are being tried as a means of eradicating contagious abortion while the value of special hygienic measures and therapeutic agents in cases of mastitis is being investigated.

The results of the inquiry into the operation and efficiency of pasteurising plants are satisfactory but improvements are desirable in many important details.

The investigation into the various defects of canned milk products is still going on.

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MACAULAY INSTITUTE FOR SOIL RESEARCH
(Craigiebuckler, Aberdeen)

The work carried out at the Macaulay Institute for Soil Research is divided into the following main groups: Soil Fertility Investigations and Advisory Work; Soil Surveys and Geological Work; The Study of Peat Soils; Soil Drainage Investigations.

Copies of reprints of articles published and any other information in regard to the work of the Institute may be obtained by applying to the Secretary.

W. S. G.

VETERINARY CERTIFICATES FOR LIVESTOCK EXPORTED TO CANADA

The Ministry of Agriculture has been notified by the Government of Canada of the amendment of the Canadian livestock importation regulations by Order in Council (No. P.C. 3280) dated December 29th, 1936, whereby veterinary certificates as to the health of all equines, cattle, other ruminants, and swine exported from Great Britain to Canada are now required, in addition to the other certificates already specified in the regulations. The Order prescribes that such health certificates must be issued by "official veterinarians of the National Government of the country of origin."

In order to comply with the new requirement it will be necessary for such certificates to be obtained from local veterinary surgeons who are veterinary inspectors of the Ministry. Application should accordingly be made to the Ministry for the name of the local veterinary inspector in the district of origin of the animals intended for export.

Certificates as to the freedom from disease of the districts of origin will continue to be issued as hitherto direct by the Ministry on application and the arrangements in force with regard to tuberculin and contagious abortion tests in the case of cattle will also continue.

N.V.M.A. DIVISIONAL REPORT

Central Veterinary Society

Dr. F. C. Minett, the essayist, and Professor J. G. Wright, the President, ensured the success of a meeting of the Society held at the Conway Hall, W.C.1, on January 7th, 1937, by contributing important communications, respectively, on the advantages of the use of toxoid in staphylococcus infections in animals, and of that of insulin in the treatment of equine haemoglobinuria.

The attendance book was also signed by the following Fellows and visitors: *Fellows.*—Captain L. S. Balls, Messrs. W. F. Barton, W. Brown, H. E. Bywater (Hon. Secretary), Captain J. C. Coleman, Major T. Dalling, Major W. Denington, Captain H. S. A. Dunn, Miss Connie M. Ford, Mr. C. Formston, Lieut.-Colonel H. G. Greenfield, Miss K. Hernaman-Johnson, Sir F. T. G. Hobday, Messrs. H. D. Jones, Herbert King, H. C. P. King, N. S. King, Lieut.-Colonel G. P. Knott, Major C. J. R. Lawrence, Captain G. Dunlop Martin, Dr. J. McCunn, Professor W. C. Miller, Miss K. Morant, Messrs. C. W. Ottaway, G. H. K. Peace, W. Perryman, Major A. A. Pryer, Mr. G. W. Searles, Major S. L. Slocock, Captain R. J. Stow, Dr. A. W. Stableforth, Mr. C. N. Thompson, Miss O. Uvarov, Messrs. G. M. Vincent, E. G. White, J. Willett, J. D. Williams, Major Grahame Williamson and Professor G. H. Wooldridge. *Visitors.*—Messrs. J. G. Greatorex, G. G. B Howat, W. W. Lang, Dr. R. Lovell, Messrs. N. J. Scorgie, A. Thomson and F. W. Withers.

The minutes of the annual dinner, held in November, and of the December meeting, which had been published in the *Veterinary Record*, were taken as read and signed as correct.

Correspondence.—(1) From the following Fellows, apologising for their inability to attend the meeting: Major G. W. Dunkin, Major Hamilton Kirk, Captain J. F. Macdonald, Mr. J. W. Pritchard, Captain W. K. Townson and Captain Sydney Villar.

(2) From the Secretary of the N.V.M.A., enclosing particulars of arrangements made by the Association with the Secretaries of certain metropolitan divisions of the British Medical Association, to enable members of the profession to attend courses in anti-gas precautions. Details of the courses were supplied and certain of them have been brought to the notice of members through the columns of the *Veterinary Record*.

The PRESIDENT, speaking to this matter, observed that this was an activity of the "National," who thought this correspondence was making the Society *au fait* with what was being done in regard to it.

(3) From the Secretary of the Royal Sanitary Institute, forwarding particulars of a conference to be held at 90, Buckingham Palace Road, S.W.1, on January 28th, for the purpose of discussing "The Administration of the Milk (Special Designations) Order, 1936, with respect to Accredited Milk," and inviting the Society to send a delegate or delegates.

The President observed that the Secretary had informed him that it was highly probable that most of the whole-time veterinary officers would attend the conference in an official capacity.

Captain Coleman said that he would like to see the general practitioner take a little more interest in the subject to be discussed at the conference and that it should not be left to the whole-time men. Fellows interested in cows would find the conference of considerable interest. It might interest them to know that Dr. Savage, who was probably the strongest exponent of the doctrine of the necessity for the pasteurisation of milk that we had in this country, was to be present.

The President stated that their Secretary would be there representing his council, and it was ultimately agreed that the Society should send official delegates, and that these should be Captain Coleman, Mr. Searles and Captain Stow.

(4) From the Secretary of the Royal Sanitary Institute, forwarding the programme of the Health Congress of the Institute to be held at Birmingham from July 12th-17th, 1937, and inviting the Society to send representatives.

The President observed that it had been their practice, for several years past, to be represented at that congress, and he felt that they could not do better than re-appoint their Secretary, Mr. Bywater, as the Society's delegate.

The proposal was enthusiastically adopted, on the proposition of Mr. H. C. P. King, seconded by Lieut.-Colonel H. Greenfield.

Elections to Fellowship. — The following gentlemen, having duly received nomination at the December meeting, were unanimously elected as Fellows of the Society: Mr. W. P. Blount (Chief Veterinary Officer, West Sussex County Council)—proposed by Mr. W. J. Pritchard, seconded by Professor J. McCunn; Professor J. B. Buxton (Acting Principal, Royal Veterinary College, London)—proposed by Professor G. H. Wooldridge, seconded by the President; and Mr. J. F. Mason, 7, Dovecot Close, Brentwood—proposed by the Hon. Secretary, seconded by Mr. T. J. Maguire.

Obituary: Sir John Bland Sutton

The President said that his next duty—and one which he sincerely deplored—was to bring to their notice the death of Sir John Bland Sutton, a most distinguished surgeon and one of the most eminent Honorary Fellows of that Society. Sir John, he understood, had honoured the Society by addressing it on a number of occasions. He would ask them to rise. [The Fellows stood in silent tribute to the memory of Sir John Bland Sutton.]

Exhibits and Cases of Interest

Captain L. S. Balls exhibited a large calculus, accompanied by a number of small vesicular calculi, taken from the bladder of a Pekingese bitch, saying that what interested him most about the case was the presence of these small stones, which numbered about 50. He wondered why these small calculi did not form round the large one, but they did not.

Replying to Mr. Nevill King, Captain Balls said that the calculi were removed *post-mortem*. The bitch was dying when she was brought to him.

Captain Stow observed that about three-and-a-half weeks previously he had a cow go down with milk fever. He inflated the udder in the usual way and she got up in five hours. She went on all right until a few days prior to that meeting, when she went down a second time—*i.e.*, after an interval of nearly three weeks, eventually responding to the same treatment. He wondered if that was an unusual occurrence.

Captain Balls recounted the case of a hunter gelding which, when hunting, cut the front of the coronet on a piece of glass. On the first day he was taken out to exercise after recovery—a considerable period—he developed azoturia. It was unusual for a horse to develop that affection when it had been taken out after a long period during which it had been kept on a low diet. The owner was exercising the animal at the time, and the horse started sweating profusely and showed the customary "boarded" condition of the muscles of the quarter.

Dr. Minett enquired if the diet of the horse in question included any item with a high sugar content, as it had been claimed that such materials reduced the incidence of equine myoglobinuria.

Captain Balls having replied in the negative, the President said that the former's reference to azoturia and Dr. Minett's to the possibilities of sugar in the diet preventing the condition, prompted him to make reference to a type of treatment of azoturia, mentioned in Continental literature and referred to by Mr. Campbell in the *Veterinary Record*, which he (the President) had carried out with some success. [Professor Wright proceeded to relate his experiences in the treatment of equine myoglobinuria with doses of insulin, and, in view of its importance to veterinary therapeutics, his account and the report of the subsequent discussion are transferred to our clinical section, *q.v.*—*Editor.*]

Mr. J. Willett (President of the Royal College of Veterinary Surgeons), who was greeted with applause on rising, said that it was several years since he spoke at one of those meetings, and he was only speaking then to relate a case that had puzzled him, in the hope that some of those present would elucidate it.

He was asked, some three weeks ago, to go down into Essex to examine a thoroughbred gelding. This horse, every now and then, had tremors of the fore-legs, neck and head, and partially flexed the knees as though going to lie down. £100 was paid for the horse in Ireland and it was going to be sold in dispute—there was likely to be a lawsuit in Northern Ireland.

Nothing much was to be noted amiss in the stable, but after galloping the animal for its wind the symptoms were greatly exaggerated. The head was depressed and the horse flexed its knees and looked as though it would go down.

He still wanted to give the condition a name: he put on the certificate that the animal was suffering from an obscure nervous disease affecting the fore-limbs, the head and the neck, that the condition was greatly exaggerated by exercise and that, in his opinion, the horse was unsafe to ride. That did not satisfy him, however, and he was wondering, if he had to go and give evidence in a court in Ireland and was asked by the judge or opposing counsel, what was the nature of the condition, whether he would not be quite at a loss. It seemed a cross between megrims and shivering of the fore-limbs.

Major Pryer observed that, while he had not seen the case, Mr. Willett had related it to him about a month previously. He had thought about it a great deal and the conclusion he had arrived at was that it was probably one of thrombo-arteritis. Sir Frederick Smith had recorded a similar case in the *Veterinary Record* in 1925, and the references were there, too.

At this stage the President rose to say that he must, with regret, draw the attention of the Fellows to the fact that they had over-stepped their time, and that they would have to come to the next, and the most important, item of that evening's meeting. Before he called upon Dr. Minett, however, he would like to extend a hearty welcome to Mr. Lang, of Brigg, who had come a long way, and to Mr. Thomson, a colleague of Major Dalling, whom he hoped would give them the pleasure of his presence on many occasions. (Hear hear.)

Paper.—Dr. F. C. Minett, Director of the Veterinary Research Institute, Camden Town, now gave his address on "Staphylococcic Infections in Animals, with some reference to the Possibilities of Preventive and Curative Treatment." This address was heard with great interest and appreciation, as were the observations made by Major T. Dalling in opening the well-sustained discussion. [Dr. Minett's address, and a report of the discussion and of the reply, will be found at the commencement of this issue.—*Editor.*]

There being no other business, the President observed that, during the course of the discussion, the Fellows had given very clear indication of their sense of indebtedness to both Dr. Minett and Major Dalling for a most informative and entertaining evening. He trusted that both gentlemen felt that that was so. (Applause.)

The payment of a similar tribute of thanks to the President for his conduct of the proceedings brought the meeting to a close.

H. E. Bywater, *Hon. Secretary.*

IN PARLIAMENT

Livestock Industry Bill in Committee

Qualifications of Commissioners

At the second sitting (on February 4th) of the Standing Committee of the House of Commons which has the Livestock Industry Bill under consideration, there was much discussion on amendments dealing with the constitution of the Livestock Commission and the Livestock Advisory Committee.

On Clause 1, which provides that the Livestock Commission shall consist of a chairman and not more than eight other members, Sir Joseph Lamb moved an amendment to secure that two of these should have "special knowledge of the livestock industry." It was essential, he said, that the members of this important Commission should be fully qualified and should have practical knowledge of the industry. Too much theory was dangerous.

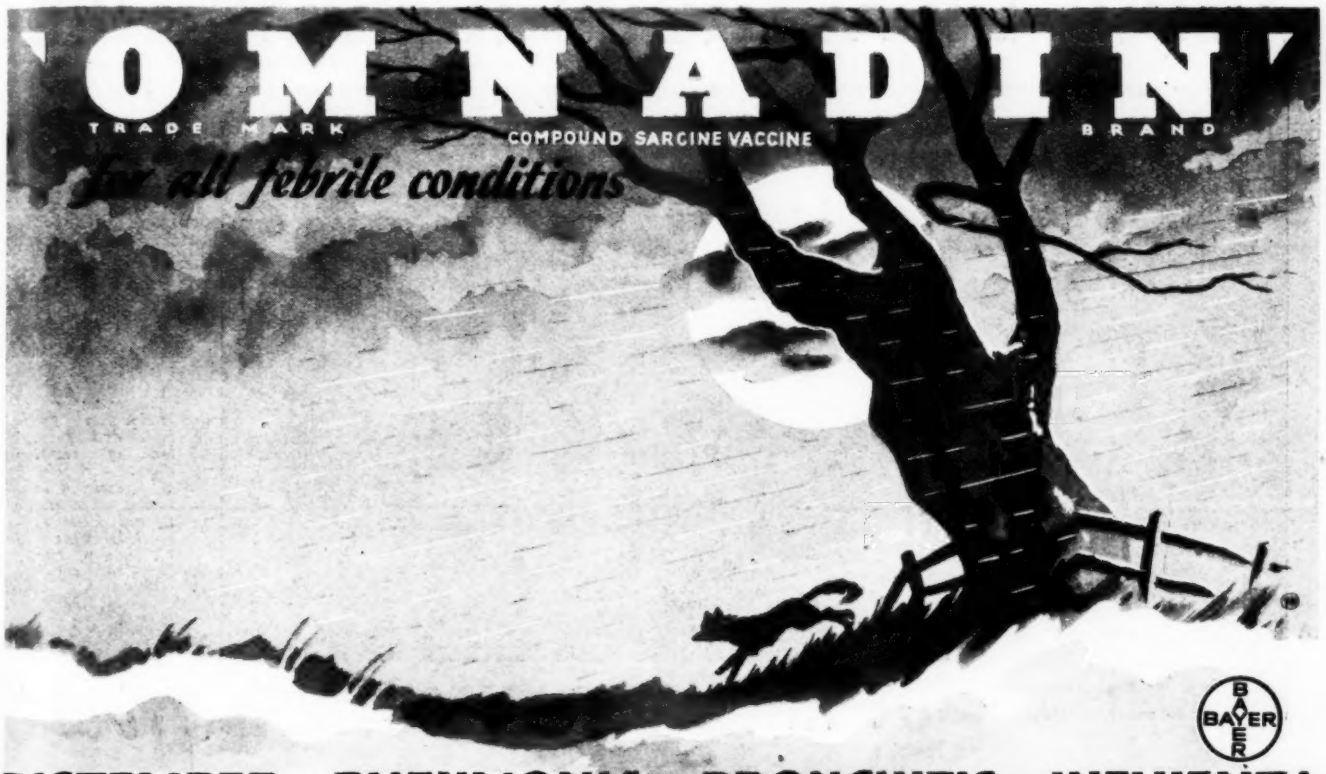
Mr. H. G. Williams said the committee must decide whether they wanted an impartial Commission or one composed of people who had interests in the industy. If the Commission was going to be representative of the industry then all sections of the industry should be represented.

Mr. T. Williams said he hoped the Minister would stand firm by the terms of the Bill. This Commission was going to determine whether the Bill was to be a mere smoke-screen for the distribution of the £5,000,000 subsidy or whether it was to be a Bill for establishing some sort of organisation in the industry. It would be wise to keep the Commission a disinterested body, so that it might retain public confidence.

Captain Heilgers agreed that the Commission should be an independent body. They had a plan in this Bill, and if they were to plan they could not let the Commission be influenced by sectional interests.

Major Dorman-Smith said that the amendment did not seek to enable producers to get control of the Commission; it only proposed that two of its members should have special knowledge of the industry. It would give producers much more confidence if they felt that they had on the Commission men who knew something of their job.

Mr. Scrymgeour Wedderburn, Under-Secretary for Scotland, said that Sir Joseph Lamb was, perhaps, unduly suspicious. The appointment of such important bodies as the Wheat Commission, the Import Duties Advisory Committee, and the Unemployment Insurance Board, had not



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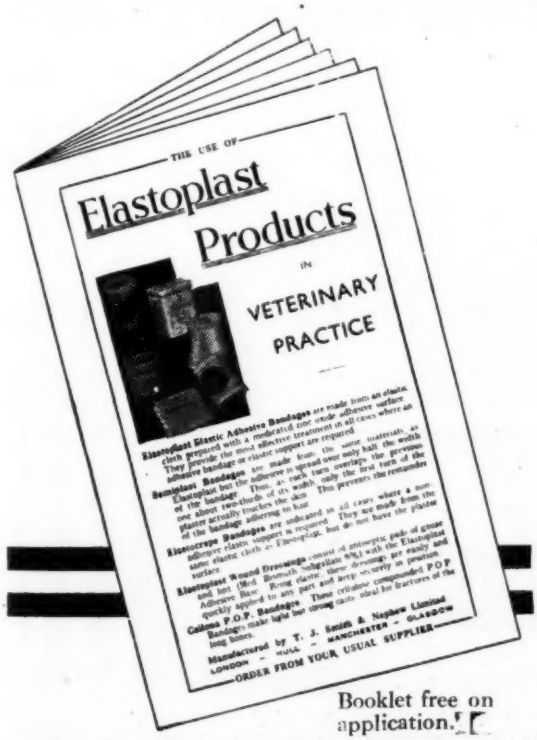

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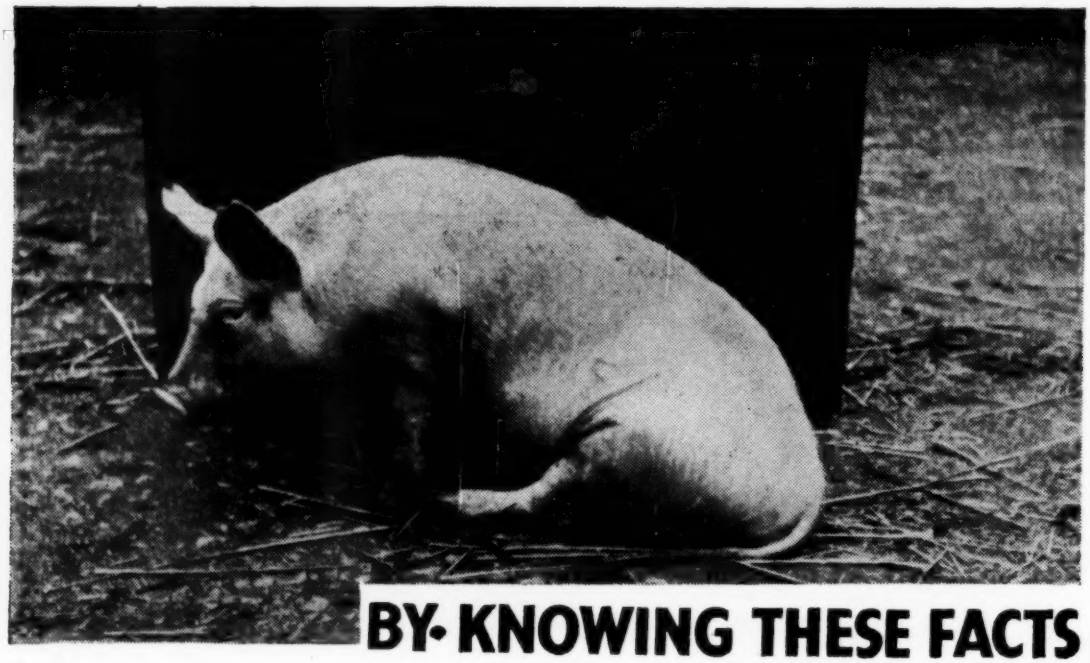

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been subjected to such statutory limitation as was here proposed. It was true that if one interest was given representation they could not fairly avoid giving many other interests representation. In that event members of the Commission, instead of being judges, as was intended, would be more in the position of advocates.

Mr. R. J. Russell said that the Commission must retain the confidence of the public as well as of the livestock industry, and the one thing that would destroy confidence in the Commission would be the presence on it of persons who were not disinterested. A common criticism of the Pigs Board was that its failure was due very largely to some of its members having interests and points of view which prevented their taking into consideration the wider problems with which they were faced.

Mr. W. S. Morrison, Minister of Agriculture, assured the Committee that duly qualified persons would be selected for membership of the Commission. Ministers were not likely to search in remote places to find persons singularly unqualified for the job. The Commission was not to be a representative body, but a body discharging executive and administrative functions. The sort of person to be selected would probably be the sort of person selected for membership of the Cattle Committee. That committee, presided over by Sir John Chancellor, had won the confidence of all in the industry by its administration of the cattle subsidy.

Sir Joseph Lamb agreed to withdraw the amendment. In doing so, he said that farmers might be suspicious of the Commission, but they could not be said to be unduly suspicious, having regard to their past experiences. It was a mistake to say that the subsidy was being given to agriculture. It was simply going through agriculture to industrial consumers to enable them to enjoy the advantage of cheap food.

Clauses 1 and 2 were agreed to.

The Advisory Committee

On Clause 3, which sets up a Livestock Advisory Committee representing various interests affected to assist the Commission in the discharge of their functions, Mr. Turton moved an amendment to provide that the independent members of the committee should not exceed three in number. The amendment was withdrawn on Mr. Ramsbotham, Minister of Pensions, giving an assurance that on the Report stage of the Bill some safeguard would be introduced to prevent the appointment of an undue proportion of independent members.

Mr. Riley moved an amendment to secure the representation of "consumers" on the Advisory Committee. Since producers, local authorities, and auctioneers were to be represented, he said, it was only reasonable that consumers should have representation, because they were the most numerous body of all.

Mr. Morrison resisted this amendment, and said that there were ample provisions in the Bill for safeguarding the interests of consumers. To some extent, all members of the committee would represent consumers. In addition, the proposals of the committee and the Commission would be subject to Ministerial assent and Parliamentary sanction. The interest of the consumer was not a technical interest, and it would be very difficult to represent consumers as such. Replying to suggestions made by Labour members, the Minister said he could not agree that the co-operative movement, which was a great distributive organisation, necessarily represented the views of the whole body of consumers.

The amendment was negatived by 26 votes to 19.

At a later session, Mr. W. S. Morrison, in resisting amendments designed to give specific representation on the committee to owners of markets or slaughter-houses and to slaughterers and butchers, said that the function of the committee was to render advice on technical matters and it was not a body for the protection of sectional interests. The protection of interests was provided for elsewhere in the Bill. Ministers were given discretion to allow the representation on the committee of "such other interests" as time and experience proved to be necessary. Butchers and slaughterers would no doubt be given representation from the beginning under this provision.

The amendments were withdrawn.

Mr. Morrison moved amendments to provide that the other interests to which representation on the committee may be given at discretion shall comprise those "concerned in the marketing or preparation for sale of livestock, or products of the slaughtering of livestock."

The amendments were agreed to.

Sir E. Ruggles-Brise moved an amendment to provide that not less than one-third of the members of the committee should be representatives of the producers. It was important, he said, that the views of producers should be adequately represented in the advice to be given to the commission.

Mr. Morrison said it would not be wise to fix the proportion of producers on the committee when the total membership had not yet been determined. In addition, he did not want this Advisory Committee to start with a wrong notion of its functions. If members of the committee were to debate questions as representatives of various interests he was apprehensive that the producers would find that the other interests would combine to vote against them. They did not want this to be a deliberate assembly proceeding by majority votes as if it were composed of parties each fighting for its own hand. If the committee started off in that spirit it would not be the best instrument for advising the Livestock Commission. He was struggling for a free hand in this matter of constituting the Advisory Committee, and if those concerned set out with the idea of obtaining numerical majorities they would not get harmonious working.

Mr. Boothby supported the Minister's view.

Sir E. Ruggles-Brise withdrew his amendment.

On Clause 4, which deals with the payment of the subsidy to producers of fat cattle, Mr. Pickthorn moved a series of amendments to exclude cow-heifers from subsidy payments and to confine the subsidy to steers and heifers bred in the United Kingdom. He said that the object of the Bill was to encourage the breeding and production of the best beef in the United Kingdom and the subsidy could hardly be graded too steeply. The cow-heifer—which was a by-product of dairying—and the imported store beast were not relevant to the plan to encourage quality production. He would prefer to see the whole of the £5,000,000 subsidy given to the producers of beef cattle herds.

Mr. Ramsbotham, on behalf of the Government, said that the subsidy payment was to be permissive, not mandatory, and at some later date in the light of experience it might be thought desirable to withdraw the subsidy for cow-heifers. But he agreed with members who had said that the time had not yet come for this and that the improvement of quality must be gradual. It would be imprudent to exclude

cow-heifers from subsidy at the beginning of the scheme. Of the animals certified for subsidy since the existing cattle subsidy scheme had been in operation, less than 4 per cent. were cow-heifers.

Nor had the time come to exclude store cattle from subsidy, although at some later date it might be possible to adopt the sense of the amendment in this matter. At present imported stores were to a large extent the raw material of the livestock industry. Last year the store cattle imported into the United Kingdom exceeded 500,000 and the industry would be gravely dislocated if these importations were hindered by the exclusion of imported beasts from the subsidy. There would be nothing to prevent the proposals of the amendment being adopted later if that was thought expedient, but at the moment it would be unwise to adopt what the industry regarded as very drastic measures.

Mr. Pickthorn withdrew his amendment.

The committee adjourned.

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The following questions and answers have been recorded in the House of Commons recently:—

REMOUNT DEPOT, ARBORFIELD

Sir R. GLYN asked the Secretary of State for War how many men have been discharged, or are under notice to leave, the remount depôt at Arborfield, Berkshire; what is their average length of service both in the Army and since joining the reserve; and what steps are to be taken to find them suitable employment, bearing in mind that they have no trade other than horse management?

Mr. COOPER: The reduction and reorganisation of the remount service, resulting from the increased mechanisation of the Army, will entail a reduction in the establishment of the Arborfield depôt on March 31st next. There will be a further reduction, probably not later than June next, when it is likely that the depôt will be closed down. All employees have been warned of the early closing of the depôt, but, apart from normal establishment fluctuations, no men at the depôt have been discharged or given notice to leave, as it is not yet known what the requirements of the reorganised service will be or how many men can be absorbed in other Army occupations. The second part of the question does not, therefore, arise. As regards the last part, I cannot at present add anything to the reply which I gave on January 26th to my hon. and gallant Friend the Member for Newbury (Brigadier-General Brown).

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MILK (REORGANISATION COMMISSION'S REPORT)

Mr. MCKIE asked the Secretary of State for Scotland whether he can make any statement as to when the policy relative to the report of the Reorganisation Committee on milk will be announced?

Mr. WEDDERBURN: I am not in a position to say when it will be possible to make a statement on the subject.

Mr. MCKIE: May I take it that we have the assurance of the Department that the policy will be announced without any avoidable delay?

Mr. WEDDERBURN: All relevant considerations will be borne in mind.

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WATERED MILK

Mr. LAMBERT asked the Minister of Health whether the milk sold in London, except for pasteurisation, is sold containing the natural amount of butter fat or whether it is watered down to comply with the legal limit?

Sir K. WOOD: The addition of water to milk intended for sale is unlawful, and I find nothing in the recent reports of public analysts in London to show that the practice mentioned in the question is resorted to. If my right hon. Friend has any particular instance in mind and will furnish me with the necessary information, I will have inquiries made.

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GAME-COURSING (CHEETAHS)

Mr. MESSER asked the Home Secretary whether he has considered the communication sent to him to the effect that a Mr. K. C. Gandar Dower has brought a team of recently captured cheetahs to England to be used for coursing with live game; and if he will inquire into the matter with a view to prohibiting this new form of cruelty?

Sir J. SIMON: The control of the admission of live animals into this country does not rest with my Department. As a result of the communication referred to, I made inquiries and am informed that twelve cheetahs are now in this country in quarantine for six months, but I have no information of the purpose for which they were imported.

Mr. MESSER: In view of the question, will the right hon. Gentleman address himself to seeing that this purpose is prohibited?

Sir J. SIMON: For my part, I should certainly do all I could to enforce the law against cruelty to dumb animals, but I do not know anything about this particular case.

Mr. LOGAN: Is the right hon. Gentleman aware that "cheaters" have often been seen on these tracks before?

SHEEP SCAB IN GLOUCESTERSHIRE

At a recent meeting of the Gloucestershire Agricultural Committee, the Diseases of Animals Sub-Committee expressed concern as to the prevalence of sheep scab in the eastern part of the county, and reported that they had intimated to the Ministry of Agriculture and Fisheries that they were prepared to support any measures which the Ministry might see fit to take to deal with the position.

Mr. R. G. Hanks asked for further information as to the districts in which the disease existed.

Mr. C. G. McIlquham (Chairman of the Sub-Committee) replied that it existed in various places, and that the sub-committee regarded the position as serious.

Mr. Hanks said he hoped that if any restrictions were imposed they would be placed upon the right people. It often occurred that an unfortunate farmer was put to all sorts of inconveniences and was subjected to numerous restrictions, and when the case had been fully investigated it was found that he was not the culprit at all. He hoped the police would do their utmost to find out who the culprits really were. They ought to be severely dealt with.

Mr. McIlquham said that penalties did not rest with the sub-committee, but with people who were not, perhaps, so keen on checking the disease. The police had been most industrious in the matter, and the disease had caused an immense amount of work. He agreed with Mr. Hanks that the penalties should be more severe, but he understood from the veterinary officers and also from the Ministry officials that the disease lay dormant for a certain time. That had been one of the causes of the trouble, and farmers had unexpectedly found the disease existing on their own farms.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Feb. 15th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

Feb. 18th.—Portrait presentation to Sir Frederick Hobday, Connaught Rooms, Great Queen Street, W.C., 3.30 p.m.

Feb. 18th.—School of Veterinary Science, University of Liverpool, Annual Dinner and Dance.

Feb. 25th.—Silver Jubilee meeting of the South-Eastern Division, N.V.M.A., at Maidstone, 3 p.m.

Feb. 26th.—Annual Dinner and Dance of the Yorkshire Division, N.V.M.A., at Leeds.

Mar. 8th.—Royal Veterinary College, London, Annual Ball (in aid of the Re-Building Fund), Park Lane Hotel, W.1.

April 1st.—Annual Fees due to R.C.V.S.

April 5th.—Last day for applications for tickets for R.C.V.S. Annual Dinner.

April 7th.—R.C.V.S. Committee Meetings.

April 8th.—R.C.V.S. Committee Meetings.

April 8th.—R.C.V.S. Annual Dinner, May Fair Hotel, Berkeley Street, W., 7.30 p.m.

April 9th.—R.C.V.S. Committee and Council Meetings.

May 6th.—Nominations for Election to R.C.V.S. Council due.

May 12th.—Coronation Day.

May 13th.—Entries for D.V.S.M. Examination due.

May 20th.—R.C.V.S. Voting Papers issued.

May 27th.—R.C.V.S. Voting Papers to be returned.

June 3rd.—R.C.V.S. Annual Meeting. Victoria Veterinary Benevolent Fund Annual Meeting.

June 10th.—D.V.S.M. Written Examination begins.

June 14th.—D.V.S.M. Oral and Practical Examination begins.

June 23rd.—R.C.V.S. Committee Meetings.

June 24th.—R.C.V.S. Committee Meetings.

June 25th.—R.C.V.S. Committee and Council Meetings.

July 5th.—R.C.V.S. Written Examinations.

July 6th.—R.C.V.S. Written Examinations.

July 8th.—R.C.V.S. Oral Examination begins.

July 26th-30th.—N.V.M.A. Congress at Bournemouth.

CHAIR OF ANIMAL PATHOLOGY, UNIVERSITY OF CAMBRIDGE

Mr. Thomas Dalling Appointed.

As we go to press we learn that at a meeting of the Electors held at Cambridge on Thursday afternoon, Mr. Thomas Dalling, M.R.C.V.S., of the Wellcome Research Laboratories, Langley Court, Beckenham, Kent, has been appointed to fill the vacancy in the Professorship of Animal Pathology, University of Cambridge, caused by Professor J. B. Buxton's resignation in consequence of the latter's appointment as Acting Principal of the Royal Veterinary College, London.

We have only the opportunity, at the moment, to extend our congratulations to the new Professor and to express, on behalf of all our readers, our gratification that this important post is to be held by so eminently well qualified a representative of the veterinary profession.

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PERSONAL

Mr. R. Grant-Ferris (Unionist) who retained North St. Pancras for the National Government in the by-election caused by Sir Ian Fraser's appointment as one of the Governors of the British Broadcasting Corporation, is the son-in-law of Major W. J. Brennan deVine, M.C., F.R.C.V.S., Chief Veterinary Officer to the City of Birmingham. Mr. Grant-Ferris, who is a Barrister-at-Law, defeated, in Mr. H. M. Tibbles, a strong Labour candidate who had carefully "nursed" the constituency since his defeat there in the November, 1935, election.

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Birth.—On January 5th, at Ormerod House, Haywards Heath, Sussex, to Muriel (*née* Taylor), wife of Kenneth Stuart, M.R.C.V.S.—a son.

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On Leave.—The following veterinary officers arrived home on leave during the month of January. Messrs. J. Heard (Nigeria), J. R. Hudson (Kenya), and J. McArthur (Northern Rhodesia).

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R.C.V.S. OBITUARY

Bailie, Samuel, Castle Street, Newtownards, County Down, Ireland. Graduated Edinburgh, January 17th, 1883; died January 29th, 1937.

Mr. Samuel Bailie, M.R.C.V.S.

News of Mr. Bailie's death was received with sincere regret by a wide circle of personal and professional friends and by all the sportsmen of his acquaintance, for his name has been a household word with the horse-loving people of County Down for more than half a century; no personality was better known or more popular at the great agricultural shows throughout the county, where jumping competitions form a prime attraction to visitors.

"Mr. Bailie was a pioneer in the art of training hunters for these competitions," says the *Northern Whig*, "and although widely

known and esteemed in his profession of veterinary surgeon, it was as a hunter specialist and an enthusiastic rider that he achieved his wider fame.

"More accomplished 'leppers' have been trained in Sam Bailie's school at Newtownards than probably in any other individual stable in the three kingdoms, and some of his earlier champions of the jumping paddock, such as Meta and Idalia are still remembered for their feats in all parts of the country, although it is more than half a century since the first-named wonderful mare was in her prime.

"Although Mr. Bailie had passed the four-score mark, he retained to the last his enthusiasm for cross-country sport. An accomplished rider but bold to the verge of recklessness in riding to hounds, he met with many a heavy fall, and it used to be debated in the hunting field among the sportsmen of 20 years ago whether he or the late James Davidson ('Nimrod,' of the *Whig*) had sustained the greater number of broken bones. But from such mishaps his splendid constitution and pluck always enabled him to recover.

"A keen judge of a young horse as well as a patient and successful maker of hunters, Mr. Bailie invariably had big strings of high-class horses entered at the principal shows. For many years in pre-Ware times there used to be friendly rivalry between him and the late Nathaniel Morton, J.P., of Ballymena, as to which should take the bigger team to the great August show in Dublin. Sometimes each of these energetic specialists and co-pioneers would have more than 30 animals entered, most of them, of course, with a view to the splendid market of Ballsbridge. Since the War Mr. Bailie's activities in this respect were less extensive, although he still made it a point to be strongly represented at the Royal Dublin as well as at other leading shows. He had a house full of trophies, the oldest more than 60 years old, and the latest captured only last summer. He was immensely proud of this collection, marking, as it did, a sustained enthusiasm which must be almost unique even in a hunting man.

"It was largely due to Mr. Bailie that jumping displays became an essential factor of almost every summer show in the country. He had a large share in the establishment of the Newtownards carnival held in conjunction with the flower show (which is the oldest of its kind in the Province), and he heartily supported the competitions organised later at Banbridge, Ballymena, Antrim, and other show centres. More than half a century ago his wonderful mare Meta began to be a popular idol at these displays, and she continued to jump faultlessly for many years afterwards, being probably the most perfect fencer that ever performed in a paddock.

"Love of sport and activity in acquiring and training hunters did not prevent Mr. Bailie from being an exceedingly busy man in his profession. He held a number of appointments as veterinary officer or adviser under various public bodies in County Down, and had also a large private practice there. All his life was passed in the county, where to all classes he was personally known and with all classes was personally popular. He might be described as a typical County Down man—plain and blunt, but of a most kindly disposition and a good friend to many a neighbour. The late Lord Londonderry had a great regard for him and always made a point of seeing him when he came to Mountstewart.

"Members of the County Down Staghounds and the North Down Harriers for the last half-century regarded him as an essential factor of their respective hunts, and a point-to-point meeting at Ballyhaft or Comber without an entry from Sam Bailie would be regarded as incomplete.

"The deceased was associated with the Masonic Order, and was one of the oldest members of the Friendship Lodge of Newtownards. His wife, who survives him (as do two sons and a daughter), was formerly a Miss Lindsay, whose family (the Lindsays of Derryboy, Crossgar) have long been prominent among the hunting folk of Down."

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FOOT-AND-MOUTH DISEASE: RECURRENCE IN HEREFORDSHIRE

A further outbreak of foot-and-mouth disease was confirmed on Friday of last week among cattle at Donnington, Ledbury, Herefordshire. In consequence, it has been necessary to maintain for a further period the restrictions in operation over an area of approximately five miles round Donnington.

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CENSUS OF LIVESTOCK

With a view to obtaining further information regarding the changes in the distribution of livestock as between summer and winter, and assisting in estimating the probable future supplies of home-produced meat, the Ministry of Agriculture and Fisheries undertook a voluntary census of livestock on December 4th, 1936. The results, published in the "Agricultural Market Report," show that on the basis of the returns made by farmers, the total number of cattle in England and Wales on December 4th was 6,648,000, as compared with 6,540,000 on June 4th, and 6,510,000 on December 4th, 1935. The cows and heifers in milk or calf show a slight increase on last year's figure, the number being 3,102,000 as compared with 3,080,000 in December, 1935.

In order to obtain additional information regarding the relative sizes of the beef and dairy herds in the country, farmers were for the first time, asked to return separately the numbers of beef and dairy cattle. The estimates, based on the returns received, show that there were 4,160,000 dairy cattle and 2,488,000 beef cattle. As might be expected, the beef herds are more important relatively to the dairy herds in Wales than in England, the numbers of beef and dairy cattle in Wales alone being 401,000 and 426,000, respectively.

The total number of sheep in England and Wales in December, 1936, is estimated at 12,912,000 compared with 12,662,000 in the previous December. Compared with a year ago, the number of ewes for breeding showed an increase of 146,000 or nearly 2 per cent. from 7,607,000 to 7,753,000, compared with an increase of 1½ per cent. between June, 1935, and June, 1936. These figures suggest that the recovery in the sheep industry is still proceeding.

The estimated number of pigs declined from 4,113,000 in December, 1935, to 4,056,000 in December, 1936, breeding sows showing a reduction of 27,000, or over 5 per cent. The number of young pigs under two months old has also declined, probably as a result of the unsettled state of the bacon industry, but there has been a slight increase in the numbers of other pigs of two months and over.

LEGAL NOTES

Sheep Scab Order Offence.—Arising out of an outbreak of sheep scab on the Whale Moor Farm —said to be the first time the disease has been found on the Lowther Home Farms in the 34 years experience of the farm manager, and to have arisen through the purchasing of rams—John Henry Mounsey, Lowther Newtown, the farm manager, was summoned at Shap for having under his charge one Border-Leicester ram and 51 blackfaced ewes affected with sheep scab and failing to give notice to the police, with all practicable speed, that the sheep were so affected or suspected of being affected, on December 3rd.

Defendant pleaded not guilty, and was represented by Mr. Q. L. W. Little, Penrith.

Superintendent Dickinson, in outlining the case, said the charge related to an outbreak of scab among sheep belonging to the Earl of Lonsdale and in charge of defendant on Whale Moor Farm. It was alleged that on December 3rd, James Rigg, senior shepherd, drew defendant's attention to the condition of two Border-Leicester rams and a ewe. Defendant took no steps to notify the police then, but the sheep were dipped two days later. On December 8th defendant was returning from Penrith when he saw P.-c. Ritchie and told him that there was reason to believe that there was scab among the sheep on Whale Moor Farm. Mr. Stinson, the county veterinary officer, examined the flock on the 9th and 10th. Among the 105 sheep one Border-Leicester ram and 51 ewes were found to be affected. Mr. Stinson was told that the other ram had died from the effects of eating frosted grass. The ram was disinterred and was found to have been skinned. It was stated that the fleece had been burned.

Mr. Oscar Stinson, M.R.C.V.S., County Veterinary Officer, said that when he examined the sheep on December 9th a casual observer would not have seen much. One ram had wool off the shoulder and several ewes showed evidence of rubbing. He examined a few of the sheep for evidence of the live parasites which were the cause of sheep scab, but owing to the recent dipping no movement of the parasites was observable. He took samples home for microscopical examination, which revealed sheep scab parasites. He continued the flock examination the following day with the patrol shepherd and found 51 blackfaced ewes and one Border-Leicester ram suffering from scab. They had been affected for from one to ten weeks. He was informed that one ram had been buried, and it was exhumed for examination. Its throat had been cut and its fleece had been removed. He was told the fleece had been burned.

Witness agreed with Mr. Little that only in the case of three or four sheep were the fleeces ragged.

Defendant, in evidence, said that on December 3rd, Rigg told him that the sheep at Whale Moor were "rather rubbing" and recommended that they should be dipped, which was done on the 5th. Rigg told witness he thought the sheep were troubled with "rain knots" caused by the wet weather. When witness was in Penrith the following Tuesday he was told by a shepherd that scab had broken out on a farm to which was sent a ram which had been with witness's ram. Witness reported the matter to the police that day. That was the first suspicion of scab he had had; he had never seen it before. There had never been a single case on the Lowther Estate during the 34 years he had been there.

Answering Superintendent Dickinson, defendant denied that Rigg told him that there was "a spot of scab." The second ram died through eating rime and the reason its throat was cut was to improve the skin.

Witness said the ram died on the 5th and the fleece was burned on the 7th.

Defendant said he did not report to the police on December 3rd because he had no suspicion of scab then.

Mr. Little said that all the sheep were in the early stages of the disease and only four had symptoms observable to the naked eye. Those symptoms were equally applicable to five other parasites. The sheep were isolated and there was no question of contact with others, so that if they had been left a further ten days before the matter was reported no harm would have been done. The question for the Bench was whether defendant could by reasonable diligence have discovered that the sheep had scab. He did discover it, because he reported to the police, but was his discovery carried out with reasonable diligence? He submitted that defendant had committed no offence at all, or, if he had, it amounted to a mere technicality from which no conceivable harm could result.

The Bench fined defendant £10 and costs.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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THE FINANCE OF VETERINARY EDUCATION

To the Editor of the Veterinary Record

Sir,—May I crave space to answer Sir Merrik Burrell's letter of January 30th, 1937, as this letter appears (in part) to be in answer to mine of a recent date? My letter was based, as I stated, on the report of the proceedings at the Mansion House as it appeared in the *Veterinary Record*. There was no question of "wilfully misquoting," but the letter was intended to cast ridicule on the statements made which were, as reported, very ridiculous, and only ridiculous inferences could be drawn. I am not surprised that Sir Merrik Burrell saw the "ridiculousness" of them. What I was surprised at, was, that Mr. Smith took them seriously—so seriously, in fact, that he felt compelled to come to the rescue. Ridiculous = contemptuous and laughable; ludicrous; droll; absurd; preposterous: take your choice of these adjectives.

Secondly, let me say at once that the veterinary profession has not, and cannot have, any antipathy to the Agricultural Research Council, as that Council is advised on veterinary matters by the members of the Animal Diseases Committees, *i.e.*, by representatives of the veterinary profession. Sir Merrik Burrell cannot get away from "research." No one denies that research is necessary to promote knowledge, but research is not the "be all" and "end all" of the profession.

The conference at the Mansion House was called to provide funds for the Royal Veterinary College, and the Lord Mayor, who presided, was of the opinion that such was the case, and I

beg leave to doubt that it was part of the "agenda" of that conference "to start the idea of the formation of a National Pool from which could be drawn for annual maintenance a sum of not less than £60,000 a year to cover the needs of all the Colleges in England and Scotland." I think that "idea" arose during the proceedings as a result of the remarks of Dr. Share-Jones and Dr. Bradley.

As to the penultimate paragraph of the letter, where Sir Merrik Burrell "prefers criticism from those who have also done some work towards the same end." *viz.*, who have given many hours of thought and work to veterinary problems. This "preference" not only applies to my ridiculous inferences, but also to you, Mr. Editor, who also criticised the remarks made at the Mansion House meeting. I also have spent many hours of thought on these problems, especially on the findings of the Gowland-Hopkins Committee of which Sir Merrik Burrell was a member, and its disparagement of the general practitioner. These "hours of thought" and action crystallised into constructive work—the "N.V.M.A. Scheme"—for the creation of a Department of Animal Health (under the aegis of the Ministry of Agriculture for preference). This scheme implements Sir Merrik Burrell's opinion as expressed in his reservation to the findings of the Gowland-Hopkins Committee. He says: "Owing to the fact that the report has gone a considerable way to rectifying the defects of an organisation to control animal diseases *based solely on the haphazard actions of over* 300 *local authorities*, as exists at present in the Untied Kingdom, I have signed it, but subject to the following reservations:—

"The nation as a whole, including even the agricultural section of it, has never appreciated fully the very large economic value of the herds and flocks in the United Kingdom, nor the large annual production of fresh wealth derived from them. Still less has the diminution of that wealth through wastage from disease been realised. I had hoped that the production of this report would bring with it the *realisation of the necessity of an attack on animal diseases on a national scale, conducted by a nationally organised staff, which I am convinced would be the most efficient and economical method.*" . . . etc.

The N.V.M.A. has given concrete help to this opinion of Sir Merrik Burrell and may one hope that he will repent and endorse the "Scheme" which differs only in one instance, and that is the inclusion of the general practitioner, from the opinion expressed above. He would then, I predict, have the whole of the profession with him.

I do not think Sir Merrik Burrell has given sufficient thought to the amount of work a student has to "put in" in order to graduate. Had he done so he would not have criticised and offered advice to the Council of the Royal College of Veterinary Surgeons as to the curriculum. What Sir Merrik Burrell warns that body against, *i.e.*, "the need to be careful not to attempt to make every graduate a *specialist* in *every* subject" is only what every graduate who obtains the diploma of M.R.C.V.S. has to know, or to put it tersely, "general knowledge." Research comes afterwards to the "right" men with "research minds."

Yours faithfully,
J. W. Hall Masheter.

Ruddle House,
Newnham-on-Severn.
February 7th, 1937.

THE "ACCREDITED MILK" CONFERENCE

To the Editor of the Veterinary Record

Sir,—On January 28th, as a delegate from the Central Veterinary Society, I attended a conference of the Royal Sanitary Institute on the Administration of the Milk (Special Designations) Order, 1935, with respect to Accredited Milk.

Papers were read by Dr. W. G. Savage, M.O.H. Somerset, Captain F. W. Medlock, C.V.O. Essex, Mr. Long, Mr. Price and others.

In short, no progresss was made.

In the first six lines of his paper Dr. Savage says, "Personally I do not regard the veterinary control required as materially influencing its safety." During the discussion, Mr. R. Simpson, President N.V.M.A., pointed out to Dr. Savage, politely but plainly, the importance of veterinary supervision.

In the *Morning Post* of the following day was a report, or partial report, of the conference repeating Dr. Savage's words and further, at the end of the report, stating: "Dr. Savage declared that routine veterinary inspection had done nothing to reduce tuberculosis in cows."

In spite of great dissension from these views at the meeting, there was no report of such dissension. I consider such remarks, unchallenged, are degrading and a slur on the veterinary services.

I hold that there should be a committee of the N.V.M.A. selected to state the views of the profession in the Press and not allow the biased opinion of one man, apparently ignorant of the capabilities of the veterinarian, to go to press unchallenged.

Yours faithfully,
G. W. Searles.

West Street,
Alresford,
Hants.
February 7th, 1937.

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"VETTED"

To the Editor of the Veterinary Record

Sir,—As reported in the issue of *Morning Post* of February 6th, Sir Ernest Graham-Little, in moving the second reading of the Medical Practitioners' Communications (Privilege) Bill in the House of Commons on February 5th, is stated to have said that "This Bill has been 'vetted' by one of our most eminent judges and this has assured me [Sir Ernest] that the clauses are adequate to make the abuse of the Bill highly improbable."

I always thought that this hitherto slang word was used by a certain class of horseowner to indicate the fact that the veterinary surgeon had overhauled or examined a horse for defects or unsoundness or had treated it for some complaint. Now it appears as if the word is being used to indicate that documents or other things have been overhauled or examined by experts to discover errors, flaws and imperfections, etc.

It apparently differs from the word "doctored," which is often used to denote patching-up, faking, altering or mending various articles or things such as old furniture or pictures, etc. Occasionally it is used by the laity when any sick or defective person is being, or has been, treated by a medical man.

Yours faithfully,
Henry Gray.

85, Earls' Court Road,
W.8.
February 8th, 1937.